AN EVALUATION OF KNOWLEDGE, ATTRIBUTES AND SATISFACTION OF RECREATIONAL FLOATERS ON THE ILLINOIS RIVER

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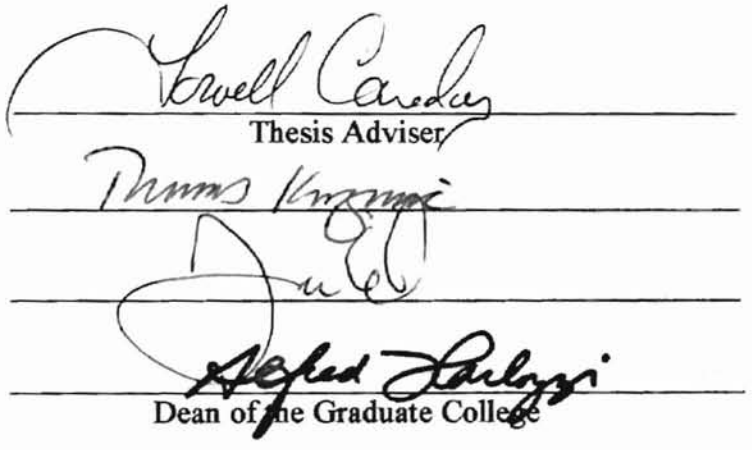

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CHAPTER I

INTRODUCTION

Popular literature dealing with the human relationships with the environment has continually stressed the need for periodic immersion in the environment (Thoreau 1962; Leopold 1949; and others). As society becomes increasingly urbanized, outdoor recreation experience is becoming among the few experiences that offer direct contact with the natural world. These brief but important interactions with nature have the potential to influence perceptions and attitudes toward the environment (Dunlap and Heffernan 1975). The significance of these nature-visitor interactions dictate that managers of outdoor recreational areas continuously evaluate the visitor and environment to provide for the highest quality experience possible.

Outdoor recreation professionals and the general public alike have often failed to recognize the role that quality outdoor experience plays in personal development and in forming positive attitudes toward the environment. Outdoor recreation should not be viewed as simply play in the outdoors, but as a unique way to strengthen the resolve toward solving environmental problems. Atkinson (1990, p. 50) writes "...outdoor recreationists provide the backbone of strong support for the environmental movement." This, if for no other reason, should compel resource managers to consider a visitor's outdoor recreation experience with sincere effort.

Justification for This Study

Outdoor recreation resource issues have been discussed since at least the late 1920s (Meinecke 1928). Since then research has investigated recreational carrying capacity, resource use impacts and management strategies to cope with increasing use. Managers have not only become responsible for the integrity of the resource itself but also for the recreational experience had by the visitor. As a consequence, the idea of quality is usually embodied, either implicitly or explicitly, in policy governing outdoor recreation areas (Manning 1986).

One of the most difficult issues in the carrying capacity equation has been setting standards of quality. Such standards may be based on a variety of sources including, but not limited to, legal mandates, agency policy, historical precedent, expert assessment, interest group politics and public opinion (especially that which is from outdoor recreation visitors) (Manning 1997). Basing standards of quality on public opinion is especially appealing as it involves those who are most directly interested in and affected by managerial decision-making.

User satisfaction has historically been one of the primary measures of outdoor recreation quality (Floyd 1997). Empirical studies of outdoor recreation satisfaction have demonstrated several influencing factors including the physical characteristics of the site, the type and level of management, the social and cultural makeup of the visitor (Propst and Lime 1982), and confirmation/disconfirmation of expectations (Pizam and Milman 1993). Satisfaction is therefore a multidimensional concept influenced by a variety of variables. Although Propst and Lime (1982) recognized that the physical attributes of a site have the potential to influence visitor satisfaction, research investigating knowledge

of site attributes (environmental) is sparse. Propst and Lime further acknowledge that the type and level of management has the potential to influence user satisfaction, yet few studies have investigated what the visiting public knows of managing agencies. There should exist a positive association between the number of times a recreation area is visited by an individual and awareness of the environmental attributes of the area and of the goals, objectives, rules and facts regarding the management of that resource. Is there a relationship, and should the relationship be integrated into future decision-making?

Dunlap and Heffernan (1975) concluded there to be an apparent relationship between involvement in outdoor recreational activities (especially those activities not detracting from the quality of the environment) and environmental concern. Their findings suggest that individuals who pursue outdoor recreational activities are most likely to demonstrate environmental concern. However, the literature investigating how environmental attitudes and concerns are influenced by recreational contact with the outdoors is inconclusive. In addressing this lack of conclusive evidence, Atkinson (1990) writes

> "Many environmental problems seem distant or almost invisible, having little immediate impact on American's lives. However, outdoor recreation fosters intimate and real contact with the natural world, demonstrating our alienation from nature's rhythms. Outdoor recreation provides most of us with our initial and most lasting encounters with nature" (p. 51).

If a positive outdoor recreation experience has the *potential* to generate positive environmental attitudes and actions, then the evaluation of the recreation experience becomes essential.

Outdoor experiences can not be understood in isolation from knowledge of the visitors themselves. Comprehension can be used to predict changes in the choices

visitors make and in the quality of their experiences. The more that is known of the visiting public, the better the quality of recreation provided them through informed managerial decision-making (Lucas 1980).

Clear information is needed about how visitors perceive the resource and why. Schreyer and Driver (1989, p. 479) investigated recreation resource management and stated "A basic problem in [recreation] resource management is making decisions that will produce the best quality of user experience, while also maintaining the resource base." They suggested that only when visitor understanding and perception of the resource has been determined can sound managerial decision-making occur.

Arcury (1990) stated that individuals who know about a subject appreciate the subject more than those who do not know the subject or know it poorly (Arcury 1990). If the postulation is correct, it is necessary to determine the baseline of knowledge and perception of the resource the visiting public possesses in order to establish a point of reference. Furthermore, if the baseline of knowledge and perception of the resource is deficient or unrealistic then increased education at the outdoor recreation site should be paramount.

Effective management of a recreational resource requires a certain level of public support (Knudson et al. 1995). Public support for the management of a resource can only occur when the public is informed or otherwise engaged as an active participant. A review of the literature supports the notion that an informed public is a public that is easier and less expensive to manage. For example, a study by Oliver et al. (1985) documented reductions in depreciative behavior at various campgrounds when interpretation was used to inform the public of the goals and objectives of the managing

body. Similarly, Vander Stoep and Gramman (1987) reported a decrease in depreciative behavior when visitors were exposed only briefly to interpretive signs at a national park. It is in management's interest to let the public know about the resource, what it is doing with the resource and why (Knudson et al. 1995). Evaluating visitor knowledge of management becomes a vital aspect of planning effective methods of disseminating information.

Purpose

Before the managers of any recreation area are able to make sound decisions they must be armed with a thorough understanding of their visitors. Going directly to the visitor is a logical starting point. While an in-depth review of the research literature and consultation with "experts" can reveal a wide variety of useful information, eventually visitor contact must take place if evaluation is to occur.

Utilizing the aforementioned literature review and the help and direction of knowledgeable professionals, this investigation was assembled. The primary intent of the study was to reveal, through data collection and analysis, aspects of visitors (floaters) on the Illinois River, a popular recreational river in east central Oklahoma (Appendix C), which may be important in future resource planning.

Specifically, the research was conducted to investigate the level of visitor knowledge of general environmental principles, site-specific ecological facts and phenomena and of management mandate of the river resource. Also investigated was the possibility of a relationship between visitor understanding of general and site-specific

environmental and ecological principles and number of times visited. An investigation into the possible relationship between visitor knowledge of river management goals, objectives, rules and facts and number of visits to the area was also executed. The investigations were designed to examine visitor knowledge of ecological concepts, as well as management's ability to disseminate goals, objectives, facts and interpretive information to the visiting public.

The study also investigated visitor knowledge of general environmental and ecological principles to determine if that knowledge was independent from the number of times a visitor had visited the recreation area. Similarly, the study investigated visitor knowledge of site-specific environmental and ecological phenomenon to determine if it was independent from the number of times a visitor had visited the recreation area. The independence analysis was extended to determine if visitor knowledge of management mandate was independent from the number of visits to the recreation area. These analyses were utilized to further examine the extent of visitor learning that occurs within the river corridor by determining if a visitor's knowledge base, per knowledge domain, is dependent or independent of visitation.

Visitor satisfaction has been utilized by managers and planners of outdoor recreation areas as indicators of experience quality (Ditton et al. 1983; Manning 1997; Floyd 1997; and others). Visitor satisfaction ratings were collected during this investigation to ascertain the level of satisfaction regarding various aspects of the Illinois River recreation experience. This investigation employed the use of satisfaction ratings to resolve those aspects the recreation experience, if any, which should be addressed in future resource planning.

To further complete the description of the recreational visitor to the area, demographic information was also collected. Additionally, the most and least important reasons floaters visit the resource were identified. The demographic information and the most/least important reasons for visitation were collected to assist in future recreation resource planning.

Research Questions

The research was directed by the following questions:

1. How is a floaters knowledge of general environmental and ecological principles related to the number of visits to the recreation area?
2. How is a floaters knowledge of site-specific environmental and ecological phenomenon related to the number of visits to the recreation area?
3. How is a floaters knowledge of river management mandate related to the number of visits to the recreation area?
4. Is a floaters knowledge of general environmental and ecological principles independent from the number of visits to the recreation area?
5. Is a floaters knowledge of site-specific environmental and ecological phenomenon independent from the number of visits to the recreation area?
6. Is a floaters knowledge of river management mandate independent from the number of visits to the recreation area?
7. What are the satisfaction levels of floaters to the area with respect to the recreation experience, recreation setting and management and outfitter effort?
8. What are the major demographic characteristics of floaters to the recreation area?

9. What are the most important and least important reasons visitors visit the recreation area?

Assumptions

The following assumptions were recognized and accepted throughout the research procedure:

1. Recreation visitors surveyed were sober and coherent and provided accurate information.
2. Participants understood the directions and intent of both the pre and post-float questionnaires.
3. Participant responses were their own and not that of another person.
4. Those being surveyed had no prior knowledge of the survey or intent of the research or investigator.
5. The survey instruments were an appropriate means of evaluating the variables of interest.

Limitations

The following limitations were recognized and accepted throughout the research procedure:

1. Only one recreational day-use river, with corresponding natural and man-made elements, was utilized for this study thus limiting the generalizability of the study to other areas with different elements.

2. Variables such as, but not limited to, extended periods of inclement weather or high or low water flow may result in response biases.
3. Non-response bias may confound post-float questionnaire results. The visitors who chose not to participate in this study may have knowledge or attitudes differing from those presented by the response group.

Hypotheses

The hypotheses investigated were as follows:

1. There is no significant correlation between knowledge of general environmental or ecological principles among Illinois River floaters as measured by the instrument used in this study and number of visits to the river corridor.
2. There is no significant correlation between knowledge of environmental characteristics specific to the Illinois River watershed among Illinois River floaters as measured by the instrument used in this study and number of visits to the river corridor.
3. There is no significant correlation between knowledge of river mandate among Illinois River floaters as measured by the instrument used in this study and number of visits to the river corridor.
4. A visitor's knowledge of general environmental and ecological principles is independent of the number of times to the recreation area as measured by the instrument used in this study of Illinois River floaters.

5. A visitor's knowledge of site-specific environmental and ecological phenomenon is independent of the number of times to the recreation area as measured by the instrument used in this study of Illinois River floaters.
6. A visitor's knowledge of river management mandate is independent of the number of times to the recreation area as measured by the instrument used in this study of Illinois River floaters.

All hypotheses were tested for significance at an alpha of .05.

Research Design and Methods

This investigation utilized both a pre and post-float questionnaire to ascertain information from the visiting public. The participants were randomly chosen recreational rafters and canoeists (floaters) who visited the Illinois River between May 31, 1999 and September 13, 1999. Both the pre and post-float questionnaires were developed and administered following the guidelines set forth by Dillman's "total design method" (1978).

The pre-float questionnaire was most often administered to participants within outfitter transport buses while en-route to the put-in location on the river, and only occasionally administered prior to departure while awaiting bus pick up. After a brief introduction to the study and acknowledgement by the visitor of their willingness to participate, the questionnaires were issued. The completed questionnaires were collected prior to entering the river. The data collection procedure is summarized in Figure 1.

The post-float portion of the survey was mailed to participants via the U.S. Postal Service. All post-float questionnaires included a cover letter with Oklahoma State University letterhead explaining the importance of response. Post-float surveys were return addressed, coded for postage and returned by the respondent to the Oklahoma State University campus. Participants who failed to respond within four weeks of mail out were again sent a post-float questionnaire, along with a modified cover letter, urging them to respond.

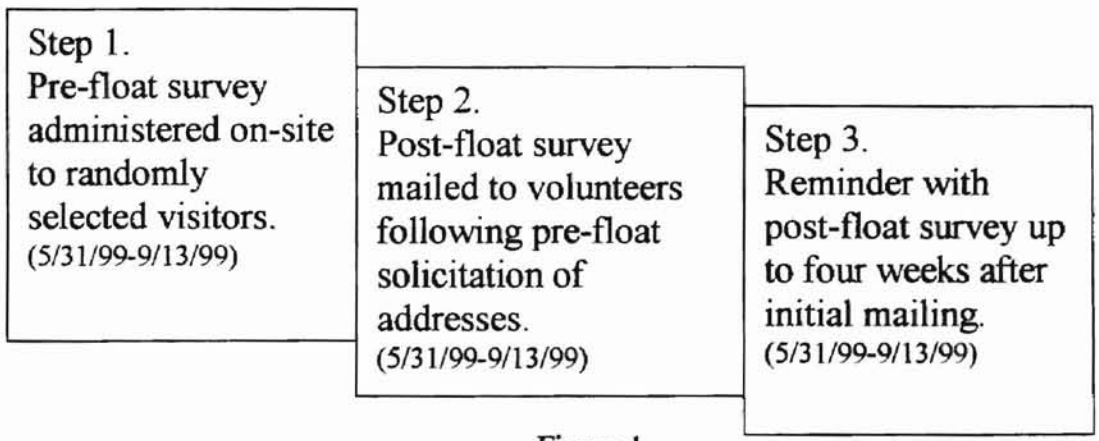

Figure 1

Definition of Terms

Defining the following terms is necessary for the reader to fully understand the study.

Commercial Flotation Device - includes canoes, boats, rafts, inner tubes or other devices which individuals rent and are suitable for transporting individuals down river (Oklahoma Administrative Code 1996).

Day-Use River – a river in which the majority of recreational activity occurs during daylight hours.

Knowledge – refers to what a person understands of generally accepted fact.

Management Mandate – refers to the rules, regulations, goals, objectives and facts associated with the management of the Illinois River resource.

Satisfaction – "an act of judgment, a comparison of what people have to what they think they deserve, expect, or may reasonably aspire to. If the discrepancy is small, the result is satisfaction; if it is large, there is dissatisfaction" (Campbell 1980, p.22).

CHAPTER II

LITERATURE REVIEW

Introduction

Considerable literature exists emphasizing the many facets of visitor satisfaction associated with recreation areas. However, literature discussing environmental knowledge among those visitors is scant. The literature investigating environmental knowledge is generally broad-based and does not focus on outdoor recreation experiences. The following review discusses research that has been conducted on the issues of recreational user satisfaction, focusing on carrying capacity and indicators of quality of experience, as well as research investigating environmental knowledge and attitudes.

A review of literature related to mail questionnaire survey research and response rates and biases was also performed. Much of the literature that exists is somewhat dated but still applicable. The preponderance of the available material addresses ways to increase response rates. Less research has investigated how response rates relate to data quality. This portion of the literature review will discuss research done on increasing response rates as well as data quality issues.

Recreational carrying capacity

Expanding recreation in the 1950s and 1960s prompted questions of appropriate use levels for outdoor recreation areas (Manning 1997). Although interest in the environmental impacts of increased use dominated early discussions there was an emerging interest in the effects of increased use on the quality of the recreation experience. Therefore, the term "recreational carrying capacity" became to be defined to include both social and ecological carrying capacity. These newly defined components provided researchers with new ways of considering recreation quality issues.

In 1935, Lowell Sumner, a National Park Service wildlife technician, became perhaps the first to suggest the concept of carrying capacity for outdoor recreation when he posed the question of how large a crowd can be turned loose in a wilderness without destroying its essential qualities (Manning 1986). Wagar (1951, p.435) listed carrying capacity as an important principle in recreation land use and wrote "Forestry, range management, and wildlife management are all based upon techniques for determining optimum use and limiting harvest beyond this point. Forest recreation belongs in the same category and will be more esteemed when so treated." Wagar (1964) conceded that the resource point of view would have to be necessarily modified to include the attention of human values. Wagar's point was that increased visitor use causes not only greater environmental impact as measured by soil compaction, destruction of vegetation and related variables, but that the increased use also causes a degradation in the quality of the recreation experience. According to Wagar, increased visitor use causes greater social impacts as measured by crowding and related variables.

Efforts to determine and apply social carrying capacity have many times met with frustration, due partly to the subjectivity involved and lack of consistent data gathering protocol. Another source of difficulty lies in determining how much social impact, such as crowding, is too much (Manning 1997).

Lucas (1964) investigated the carrying capacity of the Boundary Waters Canoe Area in Minnesota and discovered that perceptions of crowding, and hence carrying capacity from a social standpoint, varied significantly among different types of resource user groups. In short, he found that paddle canoeists were more sensitive to crowding than were motorized canoeists who, in turn, were more sensitive to other motorized boaters. The softly defined concepts of crowding and user motivation had further complicated the carrying capacity issue.

It is accepted that visitor use level and perceived crowding are related. That is, increasing numbers of visitors causes increasing percentages of visitors to report feeling crowded (Manning et al. 1996). However, it remains unclear at what point carrying capacity has been reached. To further clarify this issue, it has been suggested that research distinguish between descriptive and prescriptive components of social carrying capacity determination (Shelby and Heberlein 1986). According to these authors, the descriptive component of social carrying capacity should focus on objective data, such as the relationship between the density of visitor use and visitor perceptions of crowding. The prescriptive component of carrying capacity determination addresses the subjective issue of how much impact or change in the recreation experience is acceptable. Research that has deliberately broken the social carrying capacity issue down into these components could not be located.

The issue would become even more complex when Wagar (1968) proposed that management activity be included in the carrying capacity equation. He suggested that management could maintain or enhance the quality of the visitor by controlling for such things as a more even distribution of visitors, appropriate rules and regulations and additional facilities and education programs designed to encourage appropriate use. Stankey et al. (1985) seem to agree with Wagar in that the type of visitor experience to be provided must be defined by management and then controls be put into place to ensure that this experience is being met. Additionally, Stankey et al. (1985) argued for the monitoring of environmental and social conditions over time to assess whether acceptable conditions have been maintained. They suggest that indicators of quality are specific measurable variables that define the resource and social conditions to be managed for.

Manning (1985) suggested that management objectives for outdoor recreation be based on three considerations: (1) natural resource conditions, (2) institutional factors and (3) social factors. According to Manning, the condition of the natural resource dictates what changes, if any, should be permitted to occur given the degree of ecosystem sensitivity. By advocating that institutional factors be considered when outlining management objectives, Manning suggested that legal directives such as the Wilderness Act guide management conditions. According to Manning, social factors such as the needs and wants of people should determine appropriate uses of natural resources.

An attempt to integrate recreation values with land management planning objectives concerning the desirable resource and social conditions to be found in a recreation use area has been represented as the recreation opportunity spectrum (ROS). The ROS was conceptualized as a framework for inventorying and describing

recreational opportunities within a physical setting (Driver and Brown 1978). Recreational opportunities are seen as combinations of physical, social and managerial characteristics of settings. ROS addresses the fact that visitors desire diversity in the recreational opportunities available to them by creating and defining recreation opportunity classes. Opportunity classes are commonly defined as primitive, semi-primitive non-motorized, semi-primitive motorized, rustic, concentrated and/or modern urbanized. Each class has an associated degree of remoteness, levels of encounters with others, available recreation and type of management actions (Kaltenborn and Emmelin1993). A movement from primitive to modern urbanized typically results in a progressively less natural and smaller physical setting while user concentrations become progressively greater. The ROS is based on the assumption that the more variation in the recreation environment, the greater the variation in the types of experiences a recreational visitor could potentially enjoy.

Recreation carrying capacity and opportunity has evolved into a complex multi-dimensional concept involving resource, managerial and social considerations. The complexity of the issue has resulted in a lack of coherency in study methods, study directions and results. Perhaps the largest and most problematic issue in defining recreational carrying capacity has been in setting standards of quality.

Quality of experience

Quality of recreational experience, like carrying capacity, is a complex and multi-faceted issue, one not removed from the other. Quality of recreational experience, often

defined as user satisfaction, is a criterion that has directed many investigations regarding the concept of carrying capacity.

Stankey et al. (1985) and Graefe et al. (1990), among others, have suggested that formulating management objectives and developing indicators and standards of quality allows resource managers to skirt the more difficult issues of "how much impact is too much." This approach utilizes indicator variables, monitored over time, allowing managers to determine when standards have been exceeded. When standards have been exceeded, carrying capacity has been reached. Such an approach to carrying capacity is central to various outdoor recreation planning frameworks including Limits of Acceptable Change (LAC) (Stankey et al. 1985) and Visitor Impact Management (VIM) (Graefe et al. 1990). Both paradigms emphasize the need for qualifiable and quantifiable management objectives to define the acceptable physical and social use impacts.

Research on visitor-based standards of quality has increasingly focused on personal and social norms (Manning et al. 1993). Developed in the fields of sociology and social psychology, norms have received favorable attention as an organizing concept in outdoor recreation research and management (Lewis et al. 1996). Norms are defined as standards that individuals and groups use for evaluating social and environmental conditions (Donnelly et al. 1992).

Shelby and Heberlein (1986) and Vaske et al. (1986) describe the application of norms to standards of quality in outdoor recreation. These authors rely upon the return potential curves developed by Jackson (1965). Using this methodology, the personal norms of individuals can be aggregated in such a way as to evaluate the existence of social norms or to evaluate the degree to which social norms are shared across groups

(Manning 1997). If, during carrying capacity evaluation, visitors demonstrate normative standards with respect to recreation experiences, then these norms may be used to effectively formulate standards of quality. In this way, carrying capacity can be determined and the recreation resource managed effectively.

Much of the research examining norms has focused on the issue of crowding, and most of this research has been done in wilderness or backcountry areas. Various authors have suggested that factors such as visitor motivation and expectation influence and complicate perceptions of crowding. Ditton (1983) surveyed recreationists on the Buffalo River in Arkansas and found that those who rated high on the motivation "to get away from it all" reported significantly higher feelings of crowding than those who rated high on the motivation to "be a part of the group." A study done by Shelby (1980), of Colorado River floaters, found a significant inverse relationship between perceived crowding and expectations of contact with others. There is evidence to suggest that the type and size of a group encountered in an outdoor recreation setting may also influence the perception of crowding (Schreyer 1980), as does the perception of alikeness to the group contacted (Manning 1986). That is, noisy, rowdy and/or large groups perceived to be different are likely to influence the perception of crowding.

Undermining the use of crowding as a quality indicator, Manning (1993) stated that crowding norms may be inappropriate in relatively high-use areas because of the employment of coping mechanisms to crowding stress. Recreational displacement was cited as perhaps the most important means of coping with crowding stress. Recreational displacement is defined to occur when dissatisfied recreationists at a particular resource forego future activity at the resource, and instead pursue other recreation or another

recreation resource. Furthermore, Shelby and Heberlein (1986) concluded that studies in recreation settings generally provide little or no support for the assumption that increased use density leads to a decrease in user satisfaction. Again, displacement was cited as an important variable to be further investigated. A study by Robertson and Regula (1994) investigating the relationship between detrimental changes in a water-based recreation setting and displacement behavior concluded similarly. However, in this research, recreational displacement was caused not by crowding but by environmental degradation. The concept of recreational displacement initially arose when earlier researchers (Shelby et al. 1988) first hypothesized that recreationists who were not satisfied with their experience because of undesirable setting attributes go elsewhere, and are replaced by individuals who are satisfied with the setting. The research conducted by Robertson and Regula (1994) supported this hypothesis as they found that recreationists who reduced or discontinued their use of a specific lake were less satisfied with their most recent recreation experience at the lake than people who continued to use the area.

A few studies have focused on the visitor perceptions of recreation-caused environmental impacts as indicators of quality of experience. In general, with the exception of litter, visitors rarely complained about site conditions even if significantly degraded (Lucas 1979). A survey conducted by Solomon and Hansen (1974) reported that only one percent of the floaters on the Pine River in Michigan were concerned with the severe streambank erosion found on the river. Hammitt and McDonald (1983) surveyed floaters on several southeastern rivers to evaluate their experience with river floating as well as their perception of environmental impacts during the float experience. A large majority of even highly experienced floaters failed to notice any of the

environmental impacts of interest. Although the condition of the natural environment can affect attitudes via emotional responses (Mehrabian and Russel 1974), no literature was located suggesting how these responses affect visitor satisfaction.

Environmental Knowledge

The investigator assumes that increased knowledge of the environment and ecology influences environmental attitudes. However, relatively few studies have focused on public environmental knowledge or the relationship between environmental knowledge and environmental attitudes. Even less research has been conducted on the relationship between environmental knowledge and recreation visitor satisfaction. Although the literature is sketchy, it is the assumption of the investigator that those visitors to an environmentally degraded recreational setting who possess a high degree of environmental knowledge would tend to experience a low level of visitor satisfaction.

A great deal of research has been directed toward environmental issues, but very little effort has been expended on investigating what and how much the public knows about the environment. During the 1970s three studies using specially selected samples were published. Maloney and Ward (1973) compared members of a conservation group, a group of college students and a non-randomly selected group of adults with no college background, all from Los Angeles, California. The authors found that environmental knowledge was positively correlated with membership in a conservation group as well as with level of education. In a somewhat similar study, Ramsey and Rickson (1976) evaluated the association between environmental knowledge and environmental attitude

among high school students and concluded that increased knowledge moderates concern for the environment. Arbuthnot (1977) compared a sample of recycling center users with members of conservative churches and found that the more knowledgeable person, among other things, is relatively liberal in political, social and religious outlooks, and perceives that his actions have impacts.

In the 1980s, a national survey that included measures of environmental knowledge found that only about 20% of the sample could answer at least 70% of the environmentally oriented questions correctly (Council of Environmental Quality 1980). Using compiled results of several statewide surveys, Arcury et al. (1986) investigated aspects of public environmental knowledge. Specifically, gender differences in knowledge and concern about acid rain were examined, with males found to be more knowledgeable and concerned than women. Additionally, age, educational background and exposure to television news were found to be significantly associated with knowledge about acid rain. Arcury and Johnson (1987) measured environmental knowledge by repeating questions from the previously mentioned 1980 Council on Environmental Quality national survey. Their analyses showed that the level of public environmental knowledge in 1985 was comparable to that found in 1980-low in both instances. Their research indicated that the major correlates of environmental knowledge were education, income and gender (male). Kiernan (1995) cited research conducted by social scientists in 1993 and 1994 to assess the knowledge base in 20 countries. According to Kiernan, the research evaluated people's knowledge of basic scientific and environmental facts with a list of 12 questions. The results, according to Kiernan (1995, p. 7), "show a dismal degree of ignorance," with the United States scoring seventh on the

list with a mean score of 6.57 correct answers. Canada scored first with a mean score of 7.58; Hungary scored last at 5.75.

Much of the research investigating public environmental knowledge has focused on the issues of public concern, attitudes and world views toward the environment (Buttell 1987; Dunlap and Catton 1979; Van Liere and Dunlap 1980). These investigations indicated that younger, better-educated, urban, liberal individuals tend to have more positive attitudes toward the environmental protection movement. Factors that have demonstrated a weak or inconsistent relationship to environmental concern include gender, income and occupational prestige. As with carrying capacity research, environmental attitude research has suffered from a general lack of uniformity throughout the various investigations.

As a result of inconsistent methods and scales used in early environmental attitude research, Dunlap and Van Liere (1978) developed the New Environmental Paradigm (NEP) scale. The NEP scale is based on the theory of environmental worldview formulated by Catton and Dunlap (Catton and Dunlap 1978). This scale is the most frequently used measure of environmental concern, and has been shown to be valuable when assessing generalized beliefs about the nature of human-environment interactions (Stern et al. 1995). These authors conclude that the NEP measures "folk ecology," which they define to be "a set of beliefs that may be influenced by social structure and values and that influence attitudes, beliefs, and behavioral intentions regarding specific environmental conditions" (Stern et al. 1995, p. 723). The NEP scale does not directly assess environmental knowledge, but rather emphasizes the values and beliefs of individuals and how the forces of social structure may shape those values and beliefs.

The association between environmental knowledge and environmental attitude has been investigated and found to be weak. Arcury (1990) performed a comprehensive meta-analysis of prior investigations into the association between environmental knowledge and attitude. He accounted for previous studies that indicated a positive association between environmental knowledge and attitude with education and urban residence. He also accounted for studies indicating an inverse relationship between knowledge and attitude and age as well studies suggesting that environmental knowledge is associated with gender and income. Arcury questioned whether environmental knowledge has an association with environmental attitude independent of the influence of socio-demographic factors, and investigated the direction of the knowledge-attitude relationship. Although Arcury did find a relationship between environmental knowledge and attitude when socio-demographic factors were controlled for, the association was weak. The author cites two possible reasons for the weak association. First, the general lack of strength in the environmental knowledge-attitude association stems from the generally low level of environmental knowledge, and secondly, the measures of knowledge used in the study were limited and/or flawed (Arcury 1990). The author also stated that the relatively strong positive correlation of education to both knowledge about the environment and attitude toward the environment does suggest that knowledge leads to attitude.

Mail questionnaires in survey research

The mail questionnaire is one of the most frequently used and controversial data collection techniques for social and behavioral research. A major portion of the available literature on mail questionnaire research focuses on techniques for increasing response rates. A small portion of the literature has investigated how response rates are related to the quality of the data obtained. The following review will focus on both aspects of mail questionnaire research.

While it is generally agreed that an in-person interview is preferred when detailed examinations are required, it is also known that interviewers may introduce bias as the result of interviewer-interviewee interaction (Martin and Seiler 1977). Montero (1974) reported data that suggest mail questionnaires are more valid for sensitive topics because they tend to produce a greater frequency of socially undesirable responses. These socially undesirable responses may be an indication of reduced inhibition. Perhaps the most important reason for using mail questionnaires over other forms of data gathering is the low cost (Martin and Seiler 1977).

Response rate and generalizability has been the topic of a considerable amount of research. It is widely accepted that high response rates lead to more statistically representative results. A high response rate helps to reduce non-response bias, which can produce invalid conclusions (LaGarce and Washburn 1995). Much has been written addressing response rates and ways to increase response rates.

Visual factors such as size, layout and color dominate the literature with respect to questionnaire appearance. Studies such as Childers et al. (1980) and Jobber and

Sanderson (1983) conclude there to be little evidence to suggest that questionnaire color or format has a significant impact on response rate. LaGarce and Washburn (1995) dispute these findings and conclude that variations from the standard questionnaire format significantly enhance response rates to a questionnaire. Their research indicated that the key to improving questionnaire response rate and effectiveness is user-friendly formatting, and to a lesser extent color. LaGarce and Washburn caution against the extra expenditure associated with printing two-color instruments, they instead emphasize the importance of a well-designed and logically arranged layout.

The researcher wishing to utilize a mail survey must decide such things as whether or not to use university letterhead, pre-notifications, promises of confidentiality, personalization, specification of a deadline, or a cover letter. A review of the literature again found many aged, although relevant, studies addressing these issues.

Two studies revealed that university letterhead increased return rates. The first found that university letterhead resulted in higher returns when compared to government agencies and business firms (Cox et al. 1974). There was, however, no difference in the quality of the responses. Similarly, Peterson (1975) found that university letterhead resulted in higher response rates when compared to that of a business firm. Contrary to previous studies however, the source also influenced the quality of response. The author noted that respondents who received questionnaires with university letterhead took longer to reply than those receiving business letterhead. He concluded, questionably, that the longer response time meant that respondents were more serious about the response.

It is assumed that if research respondents know something about the research or the researcher they may be more likely to respond to a mailed questionnaire. Wiseman

(1982) reported a 20% higher return rate from a group that was precontacted by letter versus a group receiving no precontact. Walker and Burdick (1977) found that two prenotified groups displayed significantly higher return rates than one group that was not precontacted. Contrasting these studies, Parsons and Medford (1983) found no significant difference in the resulting response rates when one group was precontacted by means of a letter and the other group receiving no precontact. It remains unknown how personal precontact, such as a face-to-face introduction, influences response rates.

A major concern with mail survey research is the issue of confidentiality. Respondents may be hesitant to give out personal information unless confidentiality can be assured. It is assumed that with increased assurance of confidentiality, survey return rates should rise. Research, however, has sometimes demonstrated otherwise. Studies performed by Berman et al. (1977) and De Lameter and MacCorquodale (1980) revealed no significant differences in response rates when confidentiality was assured and when not. Only one study was located that demonstrated a statistical difference in results obtained from identified and anonymous respondents (Cox et al. 1984). Confounding the issue of anonymity versus identification, personalizing may have its own effects on response rates.

One would intuitively expect that personalizing a mailing would increase response rates. Personalizing features may include such things as signatures on letters and personally addressed letters and envelopes. In spite of the logical appeal of personalization, Linsky's (1975) review of 11 studies concluded there to be nearly as many studies reporting no advantage to personalization as are those that report an advantage. Kanuk and Berenson (1975) reviewed nine studies. Of the 14 comparisons

made within their review, personalization was associated with an increase in response rates seven times, a decline one time, and no difference was found in six cases. Cox et al. (1975) found that a personalized cover letter significantly increased the number of responses. Similarly, Dillman and Frey (1974) used personal salutations and real signatures on the cover letter to improve responses. Despite some research suggesting the contrary, most findings favor a personalized approach to mail survey research.

Some researchers have argued the importance of promptness of response. One study controlled for the inclusion of a deadline statement in the survey cover letter and found no effect on response rate (Vocino 1980). Another survey study (Henley 1976) included a slip of paper stating "Please return by __-__-__" After 14 days the group with the deadline had returned at the rate of 25.6% while those without had an 18% return rate. Later in the study, however, the return rate gap was narrowed to 28.8% and 24.1% with and without a deadline respectively. Nevin and Ford (1990) concluded that there is no consistent evidence to confirm that deadlines influence response rates.

The content of a cover letter may provide an opportunity for influencing response rates. Two studies were located investigating the effect of manipulating various appeals within the content of the survey cover letter.

Jones and Linda (1980) manipulated the cover letter to provide appeals for users (to improve services), science (data collection) and resort appeal (to help the state in promoting public parks). It was found that the type of appeal influenced response quality as well as the rate of return. The science appeal was best, followed by appeals for the user and appeals for resorts. Houston and Nevin (1981) manipulated the appeal for social utility, good for the masses, and egotistical appeal (respondent's opinion is important).

These researchers found that social utility appeal was best for university sources and that egotism was best for the business firm. Despite the limited research, it is a safe assumption that a cover letter appealing to the respondent is unlikely to reduce response rates.

In addressing survey shortcomings such as low response rates and illegible or otherwise poor quality responses, Dillman (1978) devised a step-by-step method of conducting mail and telephone surveys considered adequate for social science research. The problems of response quantity and quality are solved in part by what Dillman calls the "total design method." This stepwise procedure relies upon the identification of each aspect of the survey process that may affect response quantity or quality and then shaping the survey in a way that encourages sound responses.

For the total design method to be implemented, Dillman suggests that survey questions be contemplated at three different levels including (1) the kind of information sought, (2) the question structure and (3) the actual choice of words. Dillman concedes there to be no generally agreed upon principles for writing questions as every survey represents a unique combination of study topic, population and objectives.

In general, survey questions can be categorized as requesting information about respondent's attitudes, beliefs, behavior or demographic state. Care must be taken to word questions that precisely evaluate the domain of information the investigator is interested in. Information can be obtained by several question structures including open-ended, close-ended with ordered choices, close-ended with unordered response choices or partially close-ended questions. Each information-gathering situation requires the investigator to determine the appropriate question structure.

Dillman advocates using an attractive, well-organized questionnaire that looks easy to complete. Questionnaires, according to Dillman, appear shorter than actual when printed as photographically reduced pages in booklet format. Dillman agrees with LaGarce and Washburn, as previously mentioned, in that a well-organized layout combined with high quality printing adds to the credibility of the questionnaire.

Many of the mail survey techniques suggested by Dillman and others are intrinsically linked to increasing response rates. Appealing to the respondent is an important aspect of the mail survey process. Dillman suggests convincing respondents that a problem exists that is of importance to a group with which they identify, and secondarily, that their help is needed to find a solution. The accompanying cover letter provides this appeal and should also include appropriate letterhead, recipient's name and address and investigator's originally applied signature. A second follow-up letter is mailed to nonrespondents three weeks after the original mailout. The follow-up letter should re-state the basic appeals to the participant and should also include a replacement questionnaire. Dillman suggests that remaining nonrespondents be sent a third follow-up package, sent by certified mail, seven weeks after the original mailing.

Although many of the details of the mail survey process have been investigated and questioned, there seems to be agreement with respect to several themes. First, personalizing the data gathering process is important in increasing response rates. Second, appealing to respondents by emphasizing the importance of their input is crucial to increasing response rates and accuracy. Third, creating well-designed and logically arranged questionnaires increases the ease of completion and hence the likelihood of response.

Efforts have been made to identify important differences between respondents and nonrespondents so that the degree of bias can be estimated and a correction factor determined. Many researchers have attempted to measure nonresponse bias against known information from the population. Others have tried to interview, either in person or by telephone, a sample of nonrespondents to determine how they differ from respondents. Others yet have utilized extrapolation to determine biases. Most of the available literature emphasizes demographic and socioeconomic differences. The results of various studies indicate a deficiency in non-response bias estimation methodology.

Results from a given survey can be compared with "known" or accepted values for the population. However, when known values are used from a different data-gathering instrument, differences may occur as a result of response bias rather than non-response bias (Wiseman 1982). Even if tested items are free from nonresponse bias it is difficult to conclude that the other non-tested items are also free from bias (Schwirian 1984).

Telephone or in-person interviews have been utilized in an attempt to differentiate respondents from non-respondents. One approach has been to determine socioeconomic differences between respondents and non-respondents. For example, respondents are generally better educated than non-respondents (Vincent 1964; Kirchner and Mousley 1963). Another approach in differentiating the two is called the "interest hypothesis," which is based on the assumption that people who are more interested in the subject of a questionnaire respond more readily than those who are less interested (Hammitt and McDonald 1982). The authors point out that, upon examination, the interest hypothesis

provides little in the way of determining differences between respondents and non-respondents.

Extrapolation methods are based on the assumption that participants who respond less readily (require longer to respond) are more like nonrespondents (Ognibene 1971). The most common methods of extrapolation utilize differences in response times caused either by follow up stimuli to induce response or simply from the fact that some individuals respond more promptly than others (Ognibene 1971). The latter relies on the assumption that persons responding later are similar to nonrespondents. Ognibene states that the extrapolation method, in general, has not been found to be a valid predictor of non-response bias with the exception of extrapolation based upon two "waves" of responses. The latter was found to be superior to chance in all respects.

A cursory examination of the literature does demonstrate the difficulties associated with determining non-response biases in mail surveys. Some researchers have concluded that it is not possible to obtain valid estimates of non-response biases at all (Kanuk and Berenson 1975; Zimmer 1976; and others). Others such as Hammitt and McDonald (1982) found that although non-response bias estimation techniques were weak, survey response rates typically considered unacceptable in recreation survey research may be adequate at representing recreation samples without the need for estimation.

Oklahoma Scenic Rivers Commission and the Illinois River Management Plan

The National Wild and Scenic Rivers Act (NWSRA) was passed by Congress in 1968 to save free flowing streams that were previously receiving no protection, and has since grown from 12 rivers to over 212 rivers in 1992 (Palmer 1993). Federal agencies manage about 84% of the wild and scenic rivers, with state and local agencies managing the remaining 16% (Palmer 1993). Since the NWSRA was enacted, Oklahoma and approximately 30 other states have developed individual programs following the guidelines set forth by the national program (Oklahoma Scenic Rivers Commission (OSRC) 1998).

The OSRC was initially founded in 1976 when the U.S. Department of the Interior recommended to Congress that the Illinois River should be state managed. The idea of federal control was dropped due to strong opposition from citizens in and around the river corridor (OSRC 1998). In general, the OSRC was formed to protect and develop the state's scenic river areas and adjacent lands while respecting private land ownership as well as the aesthetic, scenic, historic, archeologic and scientific features of the river areas.

The management plan for the Illinois River and corridor was initiated in 1993 by a group of concerned citizens with help from the OSRC, National Park Service and Oklahoma State University (OSRC 1998). The proposed plan outlined the management needed to protect the river's natural, cultural and historical values. The plan proceeded as a citizen driven initiative until its completion in 1999. The completion of the Illinois River Management Plan represented the first phase of the process of goal and strategy

implementation to proceed into the future. The Illinois River is state managed by the OSRC under the guidelines of the NWSRA.

> It is the stated intent of the Illinois River Management Plan to provide for
>
> "...opportunities for semi-primitive outdoor recreation in a roaded, rural environment; clear, free-flowing, non-polluted waters providing an appropriate habitat for native fish and other life forms; and a shoreline and adjacent riparian corridor which supports native bird and animal populations, protects the natural, historic, and cultural values present in the corridor, and limits any new development or uses which may be incompatible with these goals" (OSRC 1998, p. iv).

The OSRC accomplishes this, in part, by limiting the issuance of commercial flotation device licenses. A maximum number of 3,900 permits are issued yearly for commercial flotation devices to be used on the Illinois River and nearby Flint and Barren Creeks. Of those 3,900 permits, 2368 are for weekend use only. "Commercial flotation device" includes canoes, boats, rafts, inner tubes or other devices which individuals rent and are suitable for transporting floaters down river (Oklahoma Administrative Code 1996).

Conclusion

This review of literature was assembled to provide a background for this study. The review contributed insight into previous investigations and was necessary in formulating this research approach. Literature was reviewed which investigated recreational carrying capacity, quality of recreational experience, environmental knowledge, mail questionnaire research and non-response bias, the Oklahoma Scenic Rivers Commission and the Illinois River Management Plan.

Recreation management is a complex issue. The idea and practice of managing recreational resources and the visitors to these resources has been the primary topic of many investigations. These investigations have, in general, pursued the paradigms of recreational carrying capacity (both physical and social) and quality of experience, neither removed from the other. Details of the methods, procedures and results of these studies have been enormously varied, making it difficult or impossible to draw generalized conclusions. Despite these difficulties, the literature review provided guidance with respect to past research strategies, procedures and instruments utilized and their findings.

A great deal of research has been directed toward environmental issues, but very little effort has been expended on investigating what and how much the public knows about the environment. "Environmental knowledge," like most evaluations of knowledge, is subjective and complex.

Much of the research investigating public environmental knowledge has focused on the issues of public concern, attitudes and world views toward the environment, and most of this research suffers from a serious lack of consistency among studies. As a result of this inconsistency in early environmental attitude research Dunlap and Van Liere (1978) developed the New Environmental Paradigm (NEP). The NEP scale is based on the theory of environmental worldview and is the most frequently used measure of environmental concern. The NEP has been shown to be valuable when assessing generalized beliefs about the nature of human-environment interactions. The NEP scale does not directly assess environmental knowledge, but rather emphasizes the values and beliefs of individuals and how the forces of social structure may shape those values and

beliefs. Although evaluation methodologies have been considerably varied, investigations have generally demonstrated a low level of public environmental knowledge.

The mail questionnaire is one of the most frequently used and controversial data collection techniques. Much of the available literature is somewhat dated, and a major portion of the literature focuses on techniques for increasing response rates. In addressing survey shortcomings such as low response rates and illegible or otherwise poor quality responses, Dillman devised a step-by-step method of conducting mail and telephone surveys considered adequate for social science research. The problems of response quantity and quality are solved in part by what Dillman calls the "total design method." This stepwise procedure relies upon the identification of each aspect of the survey process that may affect response quantity or quality and then shaping the survey in a way that encourages sound responses. The literature, in general, supports a questionnaire approach and format that is logically arranged, attractive, easy to follow and short.

Efforts have been made to identify the important differences in mail questionnaire research between respondents and nonrespondents so that the degree of bias can be estimated and a correction factor determined. Many different techniques for measuring non-response bias have been utilized. The literature, however, indicates an overall deficiency in accurate non-response bias estimation methodology.

A review of the literature regarding the National Wild and Scenic Rivers Act (NWSRA), the Oklahoma Scenic Rivers Commission (OSRC) and the Illinois River Management Plan necessarily focused on a limited number of sources due to the specific

nature of the content. The NWSRA was passed by Congress in 1968 to further protect natural areas. Federal agencies manage the majority of the rivers in the U.S. having "wild and scenic" designation. Those rivers not managed by Federal agencies are managed by state and local agencies following the guidelines set forth by the national program.

The OSRC was formed to carry out the state management of those wild and scenic rivers, such as the Illinois River, not managed by Federal agencies. The OSRC was formed to protect and develop the state's scenic river areas and adjacent lands while respecting private land ownership as well as the aesthetic, scenic, historic, archeologic and scientific features of the river areas. This protection was extended to the Illinois River by the development of the Illinois River Management Plan, a plan that articulates the goals and strategies for the management of the resource. The management plan was initiated in 1993 by a group of concerned citizens with help from the OSRC, National Park Service and Oklahoma State University. The completion of the plan in 1999 represented the first phase of the process of goal and strategy implementation to proceed into the future (OSRC 1998).

CHAPTER III

METHODS AND PROCEDURES

Introduction

This investigation was assembled with the intention of revealing, through data collection and analysis, attributes of recreational floaters to the Illinois River, a popular day-use river in east-central Oklahoma, which may be important in future resource planning.

The research was conducted to specifically investigate the level of visitor knowledge of 1) general environmental principles, 2) site-specific ecological facts and phenomena and 3) the management mandate for the river resource. Also investigated was the possibility of a relationship between visitor understanding of general and site-specific environmental and ecological principles and number of visits to the recreation area. An investigation into the possible relationship between visitor knowledge of river management goals, objectives, rules and facts and number of visits to the area was also executed. The latter investigation was intended to examine management's ability to disseminate information to the visiting public.

The research also investigated visitor knowledge of general environmental and ecological principles to determine if that knowledge was independent from the number of

times to the recreation area. Similarly, the research investigated visitor knowledge of site-specific environmental and ecological phenomena to determine if the level of knowledge was independent from the number of times to the recreation area. The independence analysis was extended to determine if visitor knowledge of management mandate was independent from the number of visits to the recreation area. These analyses were utilized to further examine the extent of visitor learning that occurs within the river corridor by determining if a visitor's knowledge base, per knowledge domain (Table I), is dependent or independent from visitation. For this investigation, each knowledge domain consists of a grouping of four pre-float knowledge questions that evaluate floater knowledge within a specific area.

Table I

PRE-FLOAT KNOWLEDGE DOMAINS

Domain	Measuring	Pre-Float Questions
General Ecology	Knowledge of General Ecology	3,5,6,8
Specific Ecology	Knowledge of Site-Specific Ecological and Environmental Phenomena	2,4,9,10
Management Mandate	Knowledge of River Management Mandate	1,7,11,12

Visitor satisfaction ratings were also collected during this investigation to ascertain the level of satisfaction within three separate satisfaction domains of the float experience (Table II). Additional insight into recreational floaters was obtained through

the collection of demographic data. To further complete the visitor profile, the most and least important reasons recreational floaters visit the resource were identified. For this investigation, each satisfaction domain consists of a grouping of post-float satisfaction questions that evaluate floater satisfaction within a specific area.

Table II

POST-FLOAT SATISFACTION DOMAINS

Domain	Measuring	Post-Float Questions
General Satisfaction	Overall Satisfaction	Mean of 1-15
Environmental Satisfaction	Satisfaction of Natural Environment	1,2,3,4,5,6,8,15
Mandate Satisfaction	Satisfaction of Management/Outfitter	1,7,10,11,12,13,14

This chapter describes the research setting, instrument, instrument development, methods and procedures to address the following research questions and hypotheses:

Research questions

1. What are the knowledge levels of visitors to the area with respect to general ecology, site-specific ecological phenomena and river management mandate?
2. What are the major demographics of visitors to the recreation area?
3. What are the satisfaction levels of visitors to the area with respect to the recreation experience, recreation setting and river management and outfitter effort?
4. What are the most important and least important reasons visitors visit the recreation area?

Hypotheses

5. There is no significant correlation between knowledge of general environmental or ecological principles among Illinois River floaters as measured by the instrument used in this study and number of visits to the river corridor.
6. There is no significant correlation between knowledge of environmental characteristics specific to the Illinois River watershed among Illinois River floaters as measure by the instrument used in this study and number of visits to the river corridor.
7. There is no significant correlation between knowledge of management goals, objectives, rules and facts among Illinois River floaters as measured by the instrument used in this study and number of visits to the river corridor.
8. A visitor's knowledge of general environmental and ecological principles is independent from the number of visits to the recreation area as measured by the instrument used in this study of Illinois River floaters.
9. A visitor's knowledge of site-specific environmental and ecological phenomenon is independent from the number of visits to the recreation area as measured by the instrument used in this study of Illinois River floaters.
10. A visitor's knowledge of river management mandate is independent from the number of visits to the recreation area as measured by the instrument used in this study of Illinois River floaters.

To evaluate these questions and hypotheses a pre and post-float questionnaire was developed. Both segments of the questionnaire were developed with the help and opinions of professionals, colleagues and previous river floater research. Appendix A contains outfitter interviewing scripts, respondent selection script, pre and post-float questionnaires and accompanying cover letters. The research process was reviewed and approved by the Oklahoma State University Review Board (Appendix B). All data were entered into a computer database and analyzed by SAS computer program.

Research Setting

The Oklahoma portion of the Illinois River resides in parts of Adair, Cherokee and Delaware counties (Appendix C). Most recreational floating on the Oklahoma portion of the Illinois River occurs within these three counties. According to the Oklahoma Scenic Rivers Commission (OSRC 1997), approximately 400,000 people visit the Oklahoma portion of the river corridor annually. Of this number, approximately 180,000 take advantage of water-related activities. In 1997 over 58,000 float trips were taken (OSRC 1998). The Illinois River attracts visitors from across the Midwest, including Arkansas, Kansas, Missouri, Oklahoma and Texas.

Fifteen commercial canoe and raft outfitters are located on the river between Tenkiller Ferry Reservoir and 70 miles north. Between May and September the majority (95%) of recreational floaters contract one of the commercial outfitters. About 5% contract private outfitters or float without contract during these same months. Approximately 50% contract commercial outfitters between October and April and about

50% contract private outfitters or float without contract during those months (OSRC 1998). Commercial outfitters vary widely in the services and amenities they are capable of providing (Appendix D), and in the quantity and quality of rafts, canoes and transportation vehicles available to visitors.

Caneday and Hutchison (1995) determined that visitors to the Illinois River corridor realize that a visit to the area is not a visit to wilderness. The Recreation Opportunity Spectrum, a management tool which suggests that recreation opportunities be provided based upon the physical, social and managerial characteristics of setting (Kaltenborn and Emmelin 1993), has been utilized to describe the Illinois River corridor as "a roaded natural area" (OSRC 1998, p.). Within this description is implied that visitors will be exposed to both natural and man-made attributes.

The river corridor itself encompasses approximately 38,000 acres, with a ¼ mile strip of riparian vegetation on either side of the streambed. The Illinois River and two major tributaries, Barren Fork and Flint Creek, combine to equal approximately 119 miles of stream (OSRC 1998). The corridor supports a diverse assortment of fish, amphibians, reptiles, birds and mammals, some of which are listed as threatened or endangered, as well as a rich variety of vegetation. The primary threats to the integrity of the environment include runoff from nearby poultry farms, runoff from commercial nurseries, streambank erosion from unconfined livestock and development (OSRC 1998).

Float Experience

A recreational floating experience on the Illinois River typically begins by driving parallel to the river along scenic Highway 10. All commercial outfitters can be reached via this highway. Once arrived, the visitor ordinarily pays for the trip at the outfitter office and unloads food, drinks, goods and equipment necessary to float. At this point, visitors wait in a common area for the transport vehicle to arrive for pick up. Transportation to the put-in site is ordinarily accomplished by aged school buses driven by outfitter employees. Travel time to the put-in site normally takes less than 30 minutes.

At the put-in site visitors pick up life vests and proceed to the canoe and raft storage area for departure. The duration of the float trip is chosen by the visitor, dictated by the put-in location, that is, how far upstream from the outfitter the visitor is put in to the river, and can vary between approximately 3 hours and overnight. Once at the take-out site, outfitter employees secure the canoes and rafts. Visitors then walk back to their vehicles or campsites on outfitter property.

Research Design

This study utilized both a pre-float and post-float questionnaire. The pre-float portion of the survey was, most often, administered en-route to the put-in location on the river, and only occasionally while awaiting departure. The first segment of the pre-float questionnaire consisted of twelve questions divided into three sections. Four questions were dedicated to assessing visitor knowledge of basic ecological and environmental

principles; four were intended to evaluate knowledge of site-specific environmental attributes and four evaluated visitor knowledge of the river management mandate. The second segment of the pre-float questionnaire requested the participant's name and address for post-float mail-out. This section was also comprised of a variety of questions to evaluate visitor demographic characteristics.

The post-float segment of the survey and cover letter was sent to the participant within one week of completing the pre-float portion of the study. Participants who had not responded within four weeks of the initial send-out were again sent the questionnaire and modified cover letter in an effort to prompt a response. The post-float questionnaire consisted of fifteen "satisfaction" questions, space available for voicing comments and concerns and a section for rating the most and least important reasons for visitation.

Instrument Development

Pre-Float Questionnaire

The specific objectives of the pre-float questionnaire were as follows:

1. To evaluate the level of knowledge the visiting public has with respect to general ecology and environmental science.
2. To evaluate the level of knowledge the visiting public has with respect to environmental and ecological attributes and phenomena specific to the Illinois River and corridor.

3. To evaluate visitor knowledge of river management goals, objectives, facts, rules and regulations.
4. To collect demographic data on the visiting public.

Since there was no instrument that fit the requirements of this study, it was necessary to create one. An interdisciplinary panel of Oklahoma State University faculty members, Illinois River management and investigator developed all questions in the knowledge section of the pre-float questionnaire (Appendix E). This panel, plus a previous study by Hawthorne et al. (1993), provided guidance for the final selection of demographic questions.

The knowledge section of the pre-float questionnaire (Appendix A) is divided into three knowledge domain segments to address objectives 1-3 above (Table I, page 39). The first objective was accomplished by questions number 3, 5, 6 and 8, the second objective by questions 2, 4, 9 and 10 and the third objective by questions 1, 7, 11 and 12. Cronbach's Alpha test was performed to determine the reliability of the knowledge section and attained an alpha of .5680 ($p<.0001$). Cronbach's Alpha test is a common method of testing the degree to which a test consistently measures what it is supposed to measure (Steel et al. 1997). An alpha of .5680 indicates, in general, a decent degree of consistency, with room for improvement in the assessment instrument. Panel consensus (Appendix E) was utilized to evaluate the validity of the entire pre-float instrument.

The first question of the pre-float knowledge section, "The Illinois River is managed by," was intended to evaluate the visitor's knowledge of a fundamental aspect of the managing agency, that is, the name of the managing agency. According to Knudson et al. (1995) awareness by the visiting public of the managing agency is

important for support of that agency. Question two, "One of the best indicators of water quality on the Illinois River is," evaluated a basic understanding of ecology and the realization that species diversity is directly associated with water quality. Question three, "The place in an ecosystem that a specific organism and only that organism fill is," required respondents to possess an understanding of ecology and the associated jargon. The fourth question, "During most of the summer a slimy substance can be felt on the rock bottom of the Illinois River. This slimy substance is most likely," required either an awareness of Illinois River water quality issues as stated by the OSRC (1998) or an ability to discern the correct answer given the site-specific scenario. Question five, "A plant or other organism considered to be at the bottom of the food chain is called a," is similar to question three in that it required respondents to possess an understanding of ecology and associated jargon. Question six, "An interaction that occurs when two living organisms associate closely with each other and both receive benefit from the relationship is called," was, like questions three and five, testing respondent's knowledge of ecological principles and associated terminology. Question seven, "One of the goals of the Illinois River Management Plan is to," evaluated river management's effectiveness at interpreting and disseminating objectives to the visiting public, an important process in garnering public support of the agency (Knudson et al. 1995). Question eight, "When a community of living organisms has reached a stable stage and does not undergo any further major changes," again evaluates respondent's knowledge of basic ecology and associated jargon. Question nine, "Lake Tenkiller, an impoundment downstream of this location on the Illinois River, experiences summer algae growth as a result of," required respondents to possess an awareness of the poultry farm waste controversy specific to the

river, or secondarily, an ability to choose the correct response based on knowledge of environmental processes. Question ten, "If cattle are allowed to walk to the water's edge on the banks of the Illinois River, they can damage the riparian vegetation and cause streambank___," required knowledge of the stabilizing effects of riparian vegetation as well as an awareness of environmental issues within the river corridor as stated by the OSRC (1998). Question eleven, "River management would like to be involved in which kind of relationship with local landowners," like number seven, evaluated river management's effectiveness at interpreting and disseminating their objectives to the visiting public which Knudson et al. (1995) consider so consequential. Question twelve " River management prohibits the use of____ while in the Illinois River corridor," evaluates visitor knowledge of corridor rules as set forth by the OSRC (1998).

The pre-float questionnaire section, "Information About Yourself," was intended to obtain demographic data from the visitor. The first question, "Please write your name and address. This will provide the contact address for the post-float survey to be mailed to you. (Please be assured that only the researchers have access to this information)," required respondents to write their name and address for post-float mail out. Question two, "How many times have you been to the Illinois River," was necessary to evaluate hypotheses 1, 2, 3, 4, 5 and 6 (chapter 1). Question three, " Please indicate your sex," was required to determine the distribution of male and female visitors. Question four "What is the highest level of education you have completed," was required to obtain a distribution of visitor education. Question five, "If you spent the night in the area, where did you stay on this trip," and question six, "How many nights will you spend in the area on this trip," was meant to gain insight into visitor stay patterns. Question seven, "How

many people are in your group for this trip," was included to determine group sizes. Question eight, "How much money did you spend on each of the following items for this trip to the Illinois River," was designed to ascertain dollar values spent on floating and outfitters, gasoline, food and drink, lodging and other recreation. Question nine, "What is your total household annual income before taxes," was included to evaluate visitor economic status. Questions 2, 3, 4, 5, 6, 8 and 9 were based on the Illinois River Floater Survey by Hawthorne et al. (1993). The investigator and advising faculty developed questions one and seven.

Post-Float Questionnaire

The specific objectives of the post-float questionnaire were as follows:

1. To ascertain the overall level of visitor satisfaction of the recreation experience.
2. To ascertain the level of visitor satisfaction with the physical condition of the river corridor.
3. To ascertain the level of visitor satisfaction with the non-physical aspects of the recreation experience, that is, river management and outfitter effort.
4. To provide respondents an opportunity to express their concerns, comments and suggestions to improve the recreation experience.
5. To identify the most and least important reasons a visitor recreates in the river corridor.

As with the pre-float, it was necessary to create the post-float questionnaire as

none were found appropriate for the specifics of this study. The investigator, advisory faculty, river management and the aforementioned study by Hawthorne et al. (1993) guided the final selection of post-float questions (Appendix F).

Questions 1-15 of the post-float questionnaire (Appendix A) elicited Likert-scale responses to assess several different aspects of visitor satisfaction. Response choices were "very satisfied," "satisfied," "neutral," "dissatisfied," "very dissatisfied." Responses were Likert scale and coded by the following: very satisfied=5, satisfied=4, neutral=3, dissatisfied=2 and very dissatisfied=1. The questions can be grouped into three satisfaction domains (Table II, page 40) to address the objectives listed above. The first objective was met by calculating the mean scores of all 15 questions. The second objective was accomplished by calculating the mean of questions 1, 2, 3, 4, 5, 6, 8 and 15 and the third objective by calculating the mean of questions 1, 7, 9, 10, 11, 12, 13 and 14. By allowing space for visitor concerns, comments and other suggestions, the fourth objective was accomplished. The final section of the questionnaire required respondents to list their three most and three least important reasons for visiting the river. These responses would indicate motivations for visiting the area, accomplishing objective number five. As with the pre-float segment of the survey, post-float question validity was determined by consensus (Appendix F).

Questions 1-15 of the satisfaction section required respondents to circle their level of satisfaction concerning various components of their recreation experience. Question one, "Overall experience on the Illinois River," was intended to obtain an overall indication of visitor satisfaction of the recreation experience. Question two, "Clarity of the water in the Illinois River," was based on Hawthorne et al. (1993) and was included

to determine if water clarity was a contributing factor to satisfaction or dissatisfaction with the experience. Question three, "Depth and flow of water," was intended to be an indicator of the floating conditions at the time of the recreation experience. Question four, "Appearance of the river banks," was based on Hawthorne et al. (1993) and was included due to streambank erosion addressed by the OSRC (1998) as being an important issue in the management of the resource. Questions five, "Scenic quality of the valley," and six, "Naturalness" of the Illinois River corridor," were, like question four, intended to provide visitors with an opportunity to indicate their satisfaction level regarding aesthetic qualities of the river corridor. Question seven, "Cost of the float experience," was loosely based on a question by Hawthorne et al. (1993) and was included to determine if cost was a primary contributing factor to overall satisfaction levels. Question eight, "Amount of trash seen in and along the Illinois River" was based on Hawthorne et al. (1993) and was included in view of the fact that litter has historically been an issue within the river corridor (OSRC 1998). Question nine, "Number of other boaters seen during the float trip," was included based on carrying capacity theory (Lucas 1980; Manning 1997 and others) as related to crowding. Question ten, "Behavior of other boaters seen during the float trip," like question eight, was based on Hawthorne et al. (1993) and was included because of acknowledgment by the OSRC (1998) of the need to instill in recreational floaters a "good neighbor ethic." Question eleven, "Location of rest rooms along the Illinois River," and question twelve, "number of rest rooms along the Illinois River," were based on Hawthorne et al. (1993) and included because of previously recognized concerns over facility availability and placement within the river corridor (OSRC 1980). Questions thirteen, " information provided by the outfitter," and fourteen,

"Condition of the equipment for our float experience," were loosely based on Hawthorne et al. (1993) and were intended to determine the role that the outfitter plays in visitor satisfaction. Question fifteen, "Condition of the property adjoining the river," like question six, evaluated visitor satisfaction with the overall quality of the surrounding environment. Question sixteen "What changes would make a visit to the Illinois River more enjoyable for you," was included as an open-ended question allowing respondents to comment. All visitor responses can be found in Appendix H.

Sampling Methods

Sampling Site Selection

Five of the fifteen commercial outfitters on the river were used as sampling points for the study as determined by the investigator. Five outfitters and three alternates were randomly selected by card draw to be interviewed for their cooperation and support. Outfitter managers and/or owners were initially contacted by telephone and the interviews arranged.

The interview process was informal, yet a list of specific points and questions regarding the data gathering process was intentionally covered (Appendix A). Managers of War Eagle Recreation and Diamondhead Resort were interviewed and eliminated from the list of potential sampling sites due to obvious hostility toward the investigator. The next five outfitter owners and/or managers interviewed, Eagle Bluff, Riverside Camp, Sparrowhawk Camp, Tahlequah Floats and Thunderbird Resort, expressed their interest

in the research and agreed to participate. The variability in the size and available services (Appendix E) of the outfitters selected was intended to ensure a representative sampling of recreational floaters.

Sampling Plan

Most floating activity on the river occurs on Saturday and Sunday, with visitation being dispersed in low density throughout the rest of the week (OSRC 1998). For this reason it was deemed necessary to include at least one Saturday or Sunday in the weekly sampling scheme. A coin flip determined which weekend day was to be included, and cards drawn to determine which weekday was sampled. The weekend day not initially selected was returned to the card pool and could be chosen as the second sampling day for that week. A total of two days per week were sampled.

Most floating activity on the river occurs between 9:00 A.M. and 3:00 P.M. To further randomize the study each sampling day was divided into morning and afternoon. For each sampling day selected as described above, two cards were drawn to determine which outfitters were to be sampled. A coin flip then determined which would be sampled in the morning and which was sampled in the afternoon, with noon as the dividing point. Sampling occurred between 8:30 A.M and 3:00 P.M.

Administering the Instrument

Pre-Float Questionnaire

Once on site, the outfitter was notified by the investigator of the sampling to take place. The investigator boarded the transport vehicle after all floaters were ready to depart. A statement was made, extemporaneously based on a script (Appendix A), describing the research and age requirement. A show of hands would indicate those individuals, at least 18 years of age, who wished to participate in the study. The pre-float questionnaires and pencils were then distributed. The hurried nature of the sampling method prevented participation rates from being accurately assessed, however, it is estimated that 70% of eligible participants completed the questionnaire when presented the opportunity.

Questionnaires were completed within the 15 to 30 minute trip to the put-in site. The investigator accompanied the group to the site and collected all materials upon departure from the vehicle.

Post-Float Questionnaire

The post-float segment of the study was mailed to the participant within one week of completing the pre-float. This segment was sent along with an accompanying cover letter (Appendix A) in 6" X 9" clasp envelopes. The post-float questionnaire was addressed and metered for ease of return to the investigator. Any participant failing to

respond within four weeks of mail-out was again sent a post-float questionnaire, along with a modified cover letter (Appendix A), urging them to respond.

Data Organization

Pre-Float Questionnaire

Both pre and post-float responses were entered into a database for storage and manipulation efficiency. Data from the pre-float knowledge section were entered as number of correct responses (out of four) for each of the three knowledge domains: General Ecology, Specific Ecology and Management Mandate. Any question relying on knowledge, which was left blank by the respondent, was counted as incorrect. Any question with more than one mark was counted as incorrect.

Participant names and addresses obtained from the demographics section were entered as well. If the respondent failed to include a name or address, the questionnaire was scored and recorded without the possibility of post-float contact. The remainder of the responses in the demographics section, with the exception of questions 6, 7 and 8, were coded and entered as a "1" within the corresponding answer category. Questions 6, 7 and 8 were entered with the actual number indicated by the respondent. Any of the questions 2-9 left blank were coded as a "no response."

Post-Float Questionnaire

All post-float questionnaires were sent with participant names affixed to allow matching of the pre and post-float responses. Any of the questions 1-15 left blank were scored as a "neutral." Data obtained from the satisfaction section of the post-float questionnaire were coded and entered according to the following:

1. Very satisfied=5
2. Satisfied=4
3. Neutral=3
4. Dissatisfied=2
5. Very dissatisfied= 1

Responses to question 16 "What changes would make a visit to the Illinois River more enjoyable for you?" were documented as written by the respondent. All responses can be found in Appendix G and are recorded as received.

The final section of the post-float questionnaire, question 17, was coded and entered in the same format as the actual response. A response of a "3" was entered as a 3, a response of a "2" as a 2 and a response of "1" as a 1. This section was neither coded nor entered if the respondent failed to follow directions or included erroneous marks.

Hypotheses

The following hypotheses were investigated and tested for significance at an alpha of .05:

1. There is no statistically significant correlation between knowledge of general environmental or ecological principles among Illinois River floaters as measured by the instrument used in this study and number of visits to the river corridor.
2. There is no statistically significant correlation between knowledge of environmental characteristics specific to the Illinois River watershed among Illinois River floaters as measure by the instrument used in this study and number of visits to the river corridor.
3. There is no statistically significant correlation between knowledge of management goals, objectives, rules and facts among Illinois River floaters as measured by the instrument used in this study and number of visits to the river corridor.
4. A visitor's knowledge of general environmental and ecological principles is independent from the number of visits to the recreation area as measured by the instrument used in this study of Illinois River floaters.
5. A visitor's knowledge of site-specific environmental and ecological phenomenon is independent from the number of visits to the recreation area as measured by the instrument used in this study of Illinois River floaters.

6. A visitor's knowledge of river management mandate is independent from the number of visits to the recreation area as measured by the instrument used in this study of Illinois River floaters.

Hypotheses 1, 2, 4 and 5 were determined to be important to this investigation for several reasons. First, little was known of the state of visitor knowledge with respect to the three knowledge domains. Second, little was known of the influence of interpretive and educational efforts on floaters to the river. Third, Dunlap and Heffernan (1975) acknowledged the potential influence on environmental attitudes from exposures to recreation areas such as the Illinois River. Arcury (1990) found a positive relationship between environmental knowledge and environmental attitudes. However, little effort has gone toward quantifying how visitor knowledge levels are influenced by repeat visitation. If the above authors are correct, then the educational value of the recreation experience must be evaluated to provide a recreational experience conducive to learning and enhancing environmental attitudes.

Hypotheses 3 and 6 were determined to be important for two reasons. First, little was known of the level of visitor knowledge of the Illinois River management mandate. Secondly, Knudson et al. (1995) stated the importance of disseminating management's goals, objectives, facts and regulations to the visiting public in order to garner support for the managing agency.

Hypotheses Testing

Hypothesis One, Two and Three

Each completed pre-float knowledge section was graded. Grades were entered into the database as the number of correct responses out of the four possible questions per each knowledge domain. The total correct out of four was correlated with the number of times visited as indicated by the post-float questionnaire question 2, "How many times have you been to the Illinois River." The correlation analysis was accomplished by entering the data into Statistical Analysis Software (SAS) (SAS Institute. 1996) and utilizing the rank difference correlation coefficient, usually referred to as the Spearman rho (Steel et al. 1997). All correlation analyses were tested for significance at an alpha of .05.

Hypothesis Four, Five and Six

Each respondent was ranked as low knowledge, medium knowledge or high knowledge by determining the mean score and standard deviation for all respondent scores within each knowledge domain. Ranks were determined by the following:

Low = a respondent's knowledge domain score falling within zero up to the group's mean score minus one standard deviation.

Medium = a respondent's knowledge domain score falling within the group's mean score minus one standard deviation up to the group's mean score plus one standard deviation.

High = a respondent's knowledge domain score falling within the group's mean score plus one standard deviation to a respondent's score of four.

The number of respondents within each rank were summed for each time-visited category as indicated by post-float question 2 and entered into SAS. A chi square analysis was performed to determine the dependence or independence of the two variables. All chi square analyses were tested at an alpha of .05.

CHAPTER IV

DATA ANALYSIS

Introduction

The results of the data analysis are discussed in this chapter. To present the data in the most logical manner, survey response rates will be discussed, after which visitor knowledge, visitor demographics, visitor satisfaction, most/least important reasons for river visitation and hypotheses testing will be examined.

Questionnaire Response

A summary of pre and post-float questionnaire response is shown in Table III. Of the three hundred eighty five (385) completed pre-float questionnaires collected, nineteen (19) were thrown out because of an obvious lack of participant effort and thirty-eight (38) failed to include a mailing address. A total of three hundred twenty eight (328) post-float questionnaires were mailed to participants. The U.S. Postal Service returned twenty-one (21) post-float questionnaires to the investigator because of improper address. Two hundred sixty five (265) follow up post-floats were sent to participants who were delinquent in their response, based upon the time frame established for this research. One

hundred thirty six (136) post-float questionnaires were received. A post-float response rate of 41.5% was achieved.

Table III

PRE AND POST-FLOAT QUESTIONNAIRE RESPONSE

Pre-Floats Collected	385
Pre-Floats Discarded By Investigator	19
Pre-Floats No Address	38
Post-Floats Sent To Participants	328
Post-Floats Returned Improper Address	21
Post-Floats Received	136
Post-Float Response Rate	136/328 = 41.46%

Description of Participants

Knowledge (Pre-Float)

The first section of the pre-float questionnaire consisted of an examination of visitor knowledge within three separate domains (Table I, page 39). An examination of the mean number of correct responses out of four per knowledge domain indicates that, on average, there were 1.5 correct responses per person with a standard deviation of 1.1 within the General Ecology domain. There were 2.6 correct responses per person with a

standard deviation of 1.0 within the Specific Ecology domain. There were 2.7 correct responses per person with a standard deviation of 1.0 within the Management Mandate domain (Figure 2).

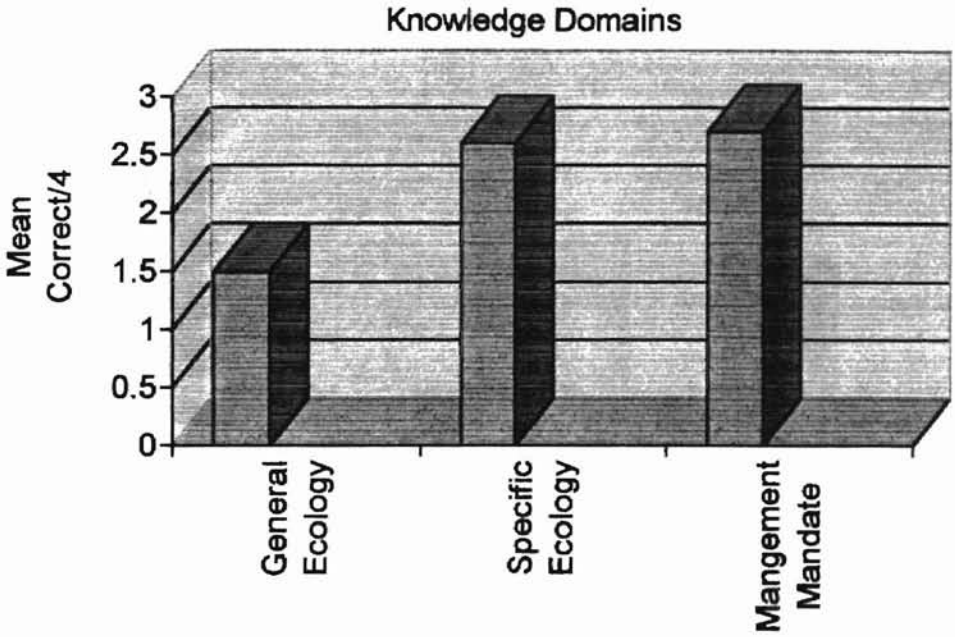

Figure 2

Demographics (Pre-Float)

Demographic data was collected with the pre-float questionnaire section "Information About Yourself." The first question of the section asked participants to write their name and address for mailing of the post-float questionnaire and will not be discussed here. The results of the second question, "How many times have you been to the Illinois River," indicated that 30.7% were visiting for the first time, 33.9% had visited

2-5 times prior, 19.2% had visited 5-10 times prior and 16.6% had visited 10 or more times prior to this visit (Figure 3). It is important to note the instrument error in terms of visit interval overlap.

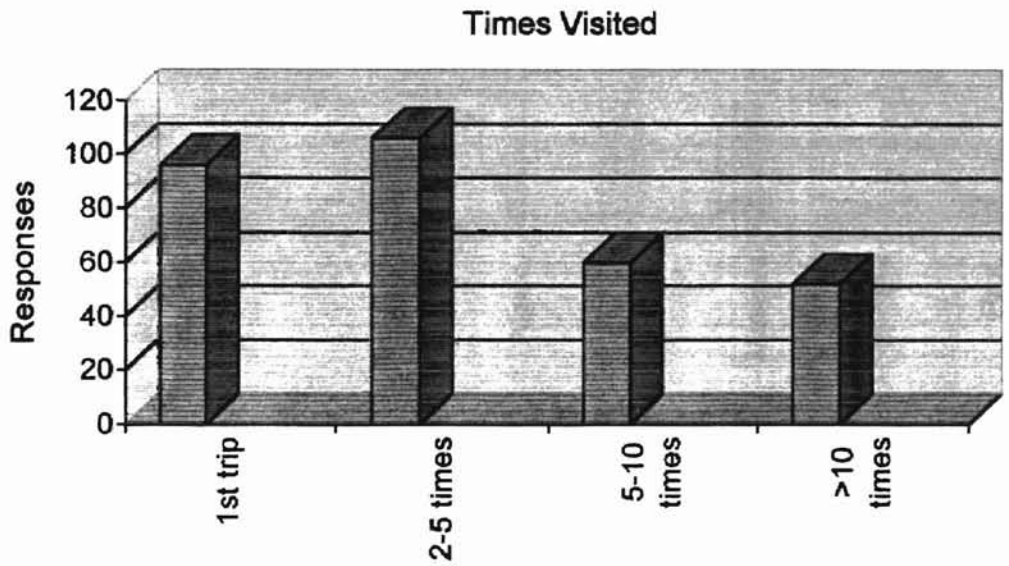

Figure 3

The third question, "Please indicate your sex," resulted in a near even number of both male and female. One hundred fifty five (155) indicated male and one hundred fifty six (156) indicated female.

Question four, "What is the highest level of education you have completed," resulted in 7.0% indicating they had not completed high school, 38.0% indicating they had graduated from high school, 6.0% indicating having a Vo-tech degree, 16.1% having an Associates degree, 19.9% having a Bachelor's degree, 10.1% having a Masters degree, 0.95% having a Doctorate degree and 1.9% indicated having a Professional degree (Figure 4).

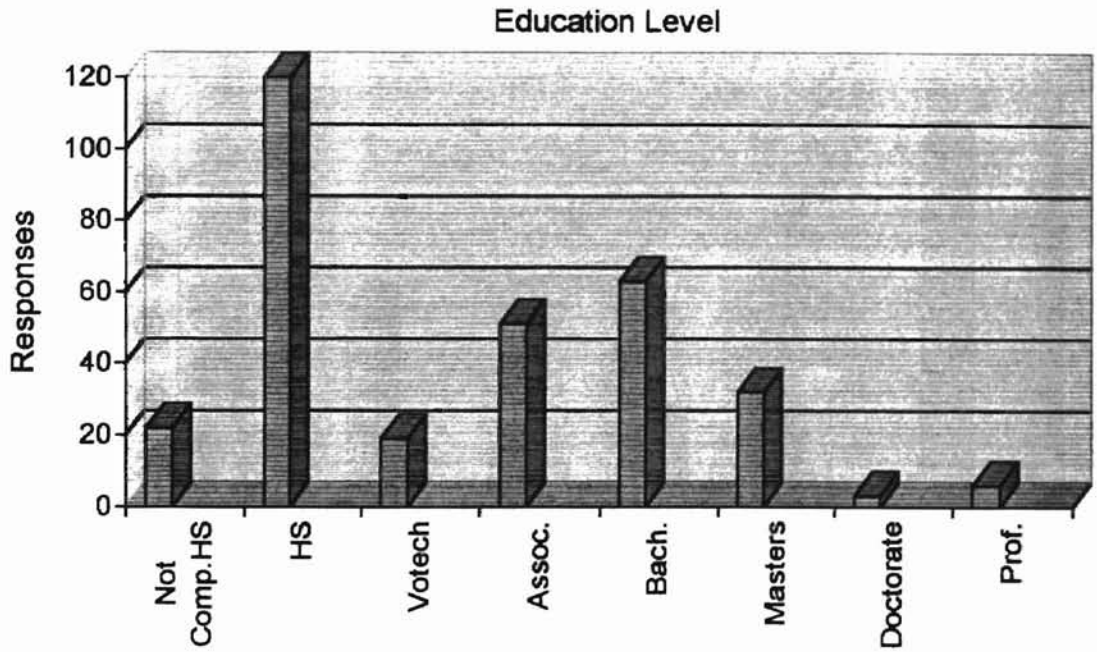

Figure 4

The fifth question, "If you spent the night in the area, where did you stay on this trip," required respondents to choose from a variety of overnight stay locations. The results indicated that 17.5% stayed in private camping areas, 2.9% stayed in public camping areas, 6.7% stayed in a hotel or motel in Tahlequah or other city, 10.1% stayed at one of the outfitters along the river, 9.2% stayed at the home of family or friends and 35.5% did not respond to the question (Figure 5). Those failing to respond may have done so as indication of not spending the night or staying in an area not listed.

Question six, "How many nights will you spend in the area on this trip," required respondents to indicate the actual number of nights spent. Responses indicated that 42.3% did not spend the night, 25.2% spent one (1) night, 26.8% spent two (2) nights, 4.0% spent three (3) nights, 0.67% stayed four (4) nights, 0.33% stayed five (5) nights, 0.67% stayed six (6) nights and 4.2% did not respond to the question (Figure 6).

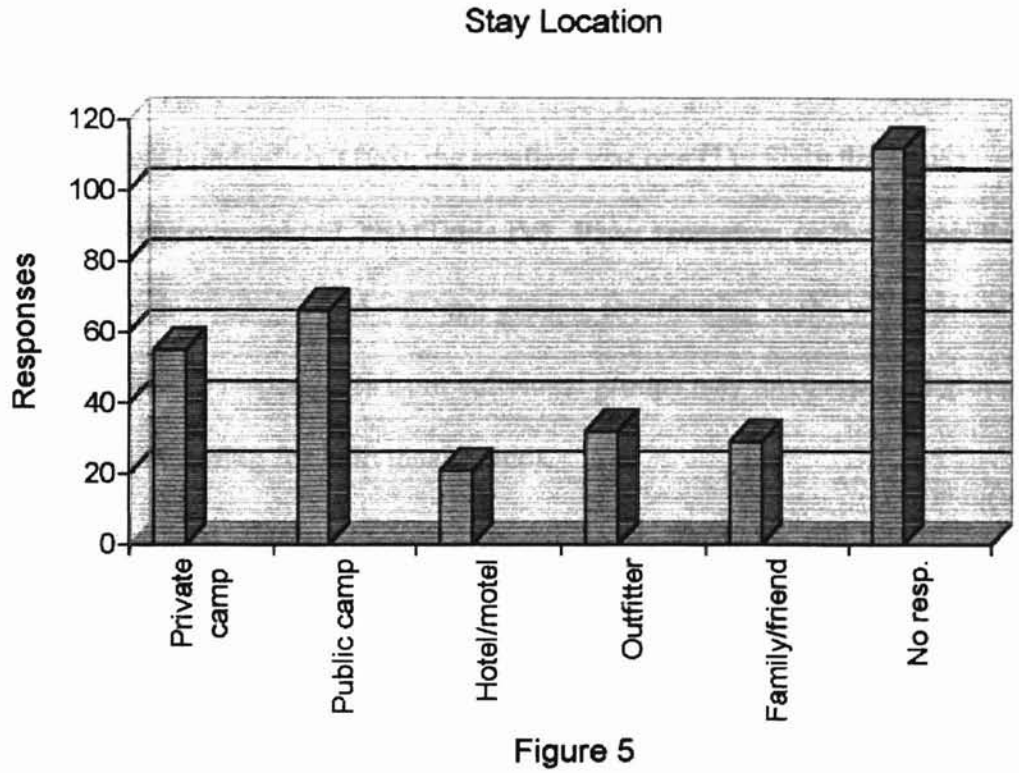

Figure 5

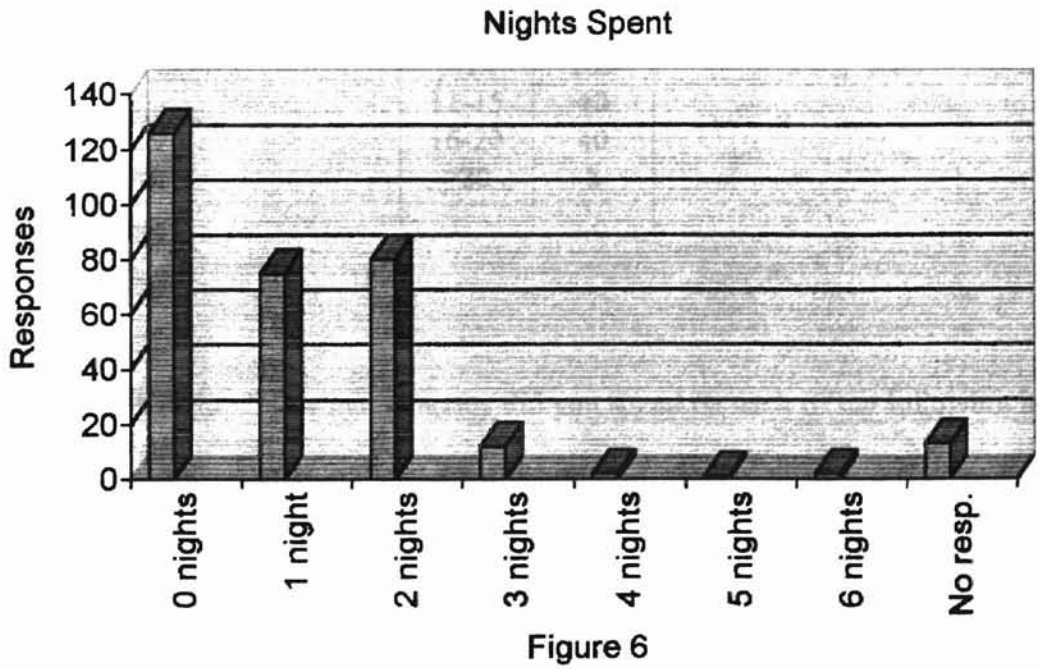

Figure 6

The seventh question, "How many people are in your group for this trip," required visitors to write the actual number of people in their group. An average of 9.7 people were in each group per trip, with a standard deviation of 5.7. The largest group size in this study was one hundred six (106), the smallest was one (1). Sixty three (63) participants did not respond (17.2%) (Table IV). River recreation on the Illinois River occurs among both organized and informal groups, contributing to the wide variability in group sizes. Multiple respondents from individual groups may have reported group size, thus duplicating reporting for individual groups.

Table IV

GROUP SIZES

Group Size	Number of respondents reporting group size
1-5	98
6-10	109
11-15	48
16-20	40
>20	8

Question eight, "How much money did you spend on each of the following items for this trip to the Illinois River," asked individual visitors to indicate a dollar amount spent on several items. These items included money spent on floating/outfitters, gasoline, food and drink, lodging and other recreation. The data was analyzed by

dividing the total amount spent per category by three hundred ten (310), the total number of respondents who answered this specific question. The per-capita spending results indicated that there was $35.06 spent per person on floating and/or outfitters, $14.13 spent on gasoline for the trip, $32.72 spent on food and drink, $12.30 spent on lodging, $7.90 spent on other recreation. Total per-capita expenditure was $102.11. There were no responses on 5.5% of the questionnaires (Figure 7).

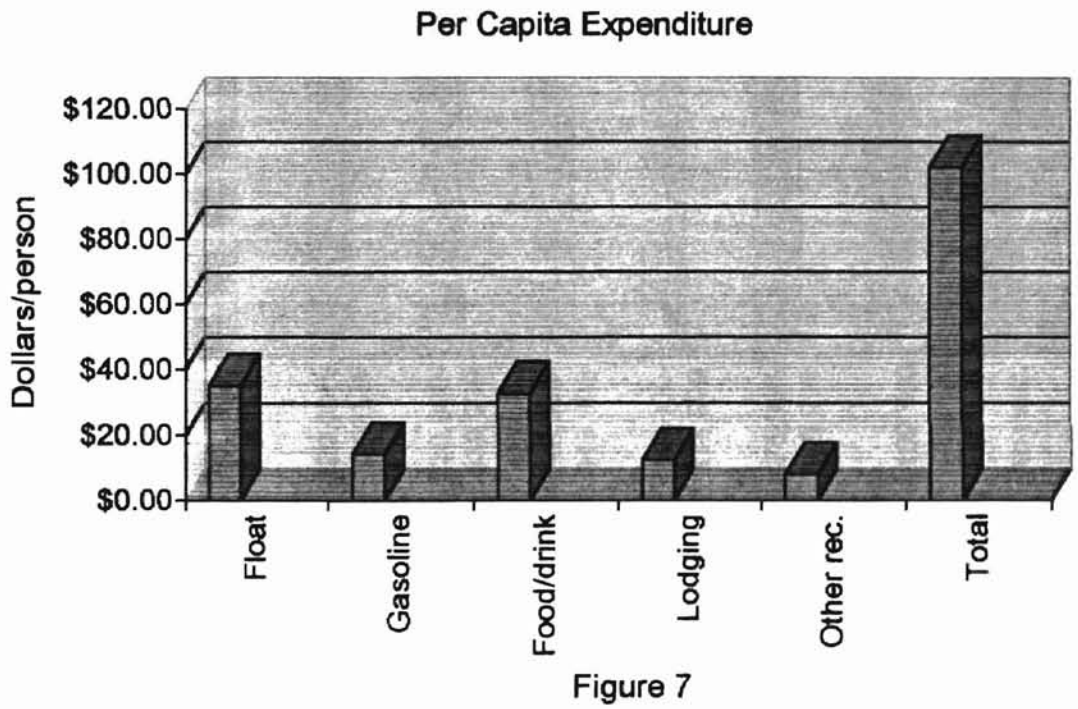

Figure 7

The final question on the pre-float questionnaire, "What is your total household annual income before taxes," required respondents to indicate which category their household income fell into. The data indicated that 13.5% of the respondents did not know how much their annual household income was, 13.2% made less than $20,000, 13.2% made between $20,000 and $29,999, 9.3% made between $30,000 and $39,999, 9.3% made between $40,000 and $49,999, 13.2% made between $50,000 and $74,999,

10.3% made between $75,000 and $99,999 and that 9.3% indicated making $100,000 per year or more. Twenty seven (27) participants did not respond (8.7%) (Figure 8).

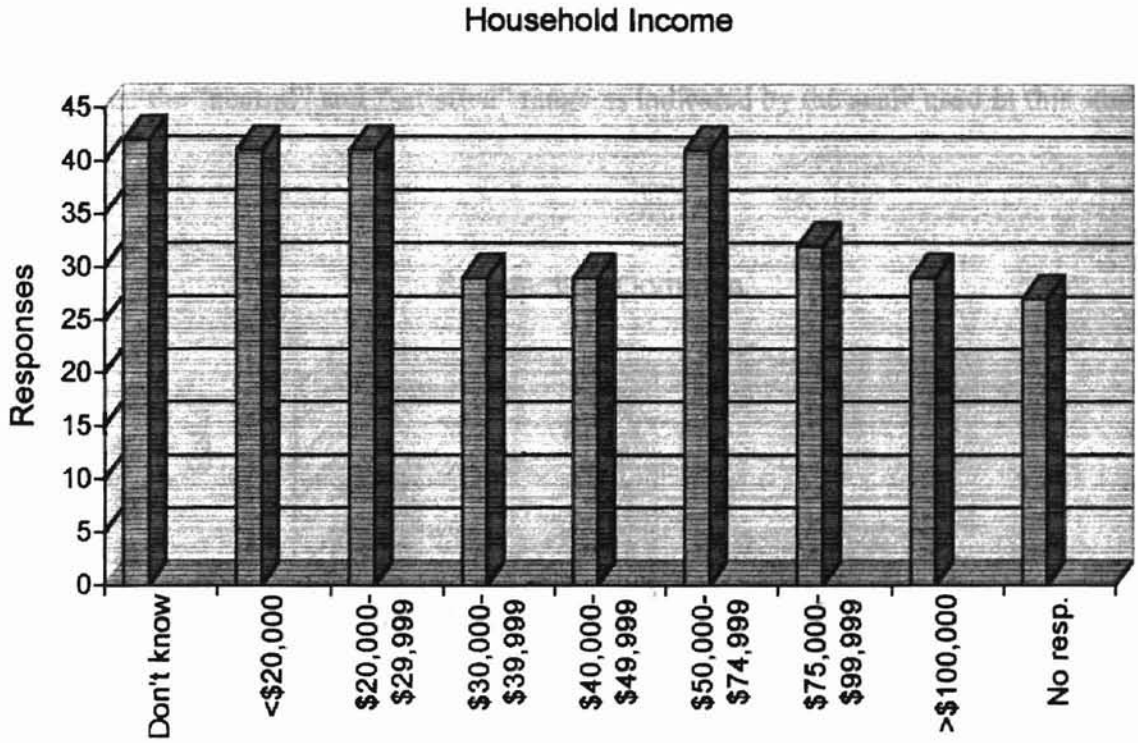

Figure 8

Satisfaction (Post-Float)

Questions 1-15 of the post-float questionnaire, "Rate your level of satisfaction with each of the following items using the scale provided," asked respondents to rate their level of satisfaction within three separate domains of the float experience (Table II, page 40). Responses were Likert scale variety and were coded by the following: very satisfied = 5, satisfied = 4, neutral = 3, dissatisfied = 2 and very dissatisfied = 1.

An examination of the General Satisfaction domain indicates that, an average satisfaction rating of 3.72 was achieved per person. An average satisfaction rating of 3.97 per person was achieved for the Environmental Satisfaction domain. An average satisfaction rating of 3.53 per person was achieved for the Mandate Satisfaction domain (Figure 9). Mean scores within each of the three satisfaction domains fell somewhere between the "neutral" and "satisfied" range as indicated by the scale used in this study.

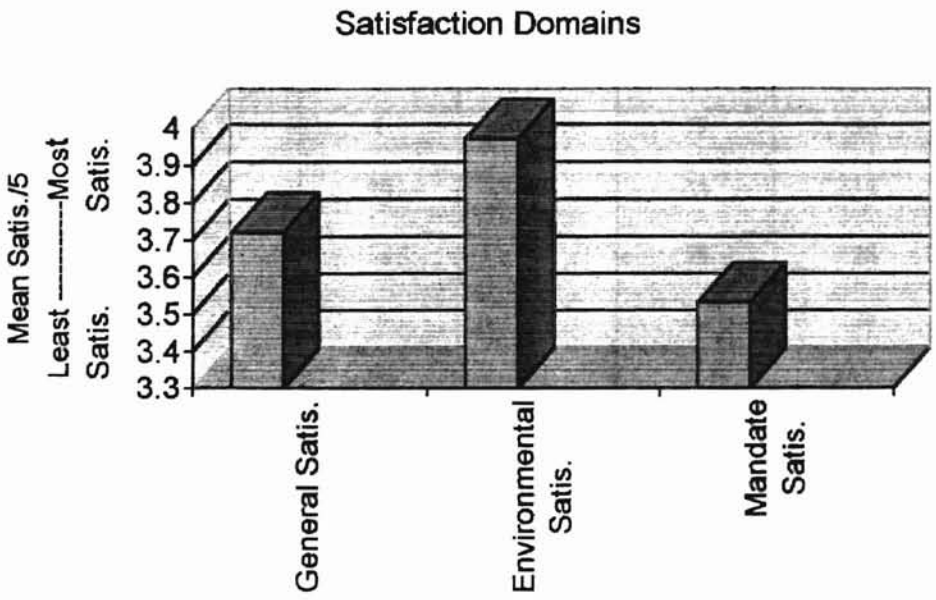

Figure 9

An evaluation was performed on each satisfaction question by determining the distribution of responses. A graphical summary of satisfaction question responses can be found in Appendix G. Table V provides a per-question summary of responses as well as mean satisfaction scores.

Table V

SATISFACTION QUESTION RESPONSE SUMMARY

Post-Float Satisfaction Question	Very Dissatisfied (responses)	Dissatisfied (responses)	Neutral (responses)	Satisfied (responses)	Very Satisfied (responses)	Mean Satisfaction Score
Overall Experience on the Illinois River	0	2	3	60	70	4.5
Clarity of Water	2	13	33	68	19	3.7
Depth and Flow	2	8	17	66	42	4.0
Appearance of river banks	1	8	28	74	24	3.8
Scenic quality of the valley	1	3	14	73	44	4.2
Naturalness of the river	1	1	20	77	36	4.1
Cost of the float experience	6	29	34	53	13	3.3
Amount of trash seen along river	4	14	31	58	28	3.7
Number of other boaters seen during float trip	3	7	36	64	25	3.7
Behavior of other boaters seen during float trip	3	9	30	60	33	3.8
Location of rest rooms along river	11	32	67	20	5	2.8
Number of rest rooms along river	14	33	65	16	7	2.8
Information provided by outfitter	4	15	32	68	16	3.6
Condition of equipment	0	8	15	82	30	4.0
Condition of the adjoining property	1	2	26	89	16	3.9

Visitor Comments

Question sixteen of the post-float questionnaire, "What changes would make a visit to the Illinois river more enjoyable for you," provided space for respondents to write

their suggestions, concerns and comments. Eighty five (85) of the one hundred thirty six (136) post-float questionnaires included comments (62.5%). Each response can be found, as written, in Appendix H. These responses are summarized in Table VI.

Table VI

VISITOR COMMENTS

Multiple Comment Categories		Single Comment Categories	
Comment Categories	# of Comments	Comment Categories	# of Comments
Too expensive	19	Too dangerous	1
Too few restrooms	15	Pave the roads	1
Too many rowdy people	10	Offer rides to parking areas	1
Poor river/float information	10	Too few rapids	1
Too much trash	10	Too few shelters	1
Outfitter restrooms too dirty	8	Add picnic areas	1
Boats need repair	6	Remove chicken houses	1
Better tent camping areas	5	Busses need repair	1
Water too low	5	Too few concessions	1
Water too dirty	5	Too much erosion	1
Too many drunks	5	Closer overnight facilities	1
Water too high	4	Need to fine for littering	1
Too many people	4	Too many cigarettes	1
Too many trees in water	3	Limit underage drinking	1
Not very scenic	3	Survey too hard	1
Thoroughly enjoyed	3	RV time limits too short	1
More hot water at outfitters	3	Add rope swings	1
Too few trash cans	3	Add fun places to stop	1
Too little wildlife	2	_	_
Add learning opportunity	2	_	_
Improve beaches	2	_	_
Trip too short/long	2	_	_
Too many rules	2	_	_

Most and Least Important Reasons for Visitation

The final section of the post-float questionnaire, "From the following list, please identify the three most important and three least important reasons you have for visiting

the Illinois River," required respondents to put a "1" by the most and least important reason, a "2" by the second most and least important reason and a "3" by the third most and least important reason for visiting the river. An examination was performed on each category of reasons for visiting by summing the number of responses within each category for each importance rank, "1," "2," and "3." The responses are summarized in Table VII.

According to the list of activities used in this study, the most important reason floaters visit the Illinois River is for "Canoeing, rafting, tubing and kayaking." The second most important reason for visitation is to "Have a day of fun with friends and family," and the third most important reason is to "Enjoy the natural environment." The least important reason for visitation is to "Party hearty," the second least important reason is to "See the guys/see the girls," and the third least reason is to "Observe plants."

Table VII

MOST/LEAST IMPORTANT REASONS FOR VISITATION

Reasons for visiting	Most Important Reasons (number of responses)			Least Important Reasons (number of responses)		
	1	2	3	1	2	3
Canoeing, Rafting, Tubing	30	33	12	0	0	0
Camping	1	8	6	2	1	2
Fishing	0	0	0	6	6	9
Picnicking	0	2	4	1	1	3
Photography	0	0	1	1	8	11
Observe Wildlife	0	0	1	6	7	4
Sun-bathing	1	3	13	7	3	10
Exercise	0	1	4	1	1	6
Seek Solitude	1	2	1	1	8	9
New friends	0	0	2	4	2	9
Enjoy natural environment	4	17	16	0	0	1
Day with friends, family	39	16	17	0	0	0
Observe plants	1	0	0	8	10	10
See guys/girls	1	1	1	12	25	3
Party hearty	5	1	3	31	9	4

Hypothesis 1

There is no significant correlation between knowledge of general environmental or ecological principles among Illinois River floaters as measured by the instrument used in this study and number of visits to the river corridor.

Each completed pre-float knowledge section was graded. Grades were entered into the database as the number of correct responses out of the four possible questions within knowledge domain 1. The total number of correct responses out of four was correlated with the number of times visited as indicated by the post-float questionnaire question 2.

Utilizing SAS, a Spearman rho correlation performed on the general ecology domain and the number of visits to the river showed no significant correlation ($r=-.0946$, $p=.0641$) at the .05 level of significance (Table VIII). Therefore, there is insufficient evidence to reject hypothesis number one, suggesting that visitor knowledge within this knowledge domain is neither positively nor negatively related to the number of visits to the recreation area.

Hypothesis 2

There is no significant correlation between knowledge of environmental characteristics specific to the Illinois River watershed among Illinois River floaters as measure by the instrument used in this study and number of visits to the river corridor.

As discussed for hypothesis 1, grades were entered into the database as the number of correct responses out of the four possible questions within knowledge domain

2. The total number of correct responses out of four was correlated with the number of times visited as indicated by the post-float questionnaire question 2.

Utilizing SAS, a Spearman rho correlation performed on the specific ecology domain and the number of visits to the river showed no significant correlation (r=.0696, p=.1737) at the .05 level of significance (Table VIII). Therefore, there is insufficient evidence to reject hypothesis number two, suggesting that visitor knowledge within this knowledge domain is neither positively nor negatively related to the number of visits to the recreation area.

Hypothesis 3

There is no significant correlation between the number of visits to the Illinois River among Illinois River floaters as measured by the instrument used in this study and knowledge of management goals, objectives, rules and facts.

As with hypotheses 1 and 2, grades were entered into the database as the number of correct responses out of the four possible questions within knowledge domain 3. The total number of correct responses out of four was correlated with the number of times visited as indicated by the post-float questionnaire question 2.

Utilizing SAS, a Spearman rho correlation performed on the management mandate domain and the number of visits to the river showed a significant, but weak, positive correlation (r=.1220, p=.0167) at the .05 level of significance. There is sufficient evidence to reject hypothesis number three, suggesting that visitor knowledge of

management mandate is positively related to an increasing number of visits to the river corridor (Table VIII).

Table VIII

SPEARMAN RHO CORRELATION COEFFICIENTS

Knowledge-general ecology	Knowledge-specific ecology	Knowledge-management mandate
r= -.0946 p=.0641	r=.0696 p=.1737	r=.1220 p=.0167*

* significant at alpha=.05

Hypothesis 4

A visitor's knowledge of general environmental and ecological principles is independent of the number of visits to the recreation area as measured by the instrument used in this study of Illinois River floaters.

Each respondent was ranked as low knowledge, medium knowledge or high knowledge by determining the mean score and standard deviation for all respondent scores within the general ecology knowledge domain and ranks determined by the protocol set forth in chapter 3. The number of respondents within each rank for the general ecology knowledge domain were summed for each time-visited category as indicated by post-float question 2 and entered into SAS.

Utilizing SAS, a chi square analysis performed on the general ecology knowledge domain and number of visits to the river showed no significance (p=.1560) at the .05 level of significance (Table IX). Therefore, there is insufficient evidence to reject

hypothesis number four, suggesting that visitor knowledge within this knowledge domain is independent of the number of visits to the recreation area.

Table IX

GENERAL ECOLOGY/TIMES VISITED CHI-SQUARE

(OBSERVED FREQUENCIES)

	Times Visited				
Knowledge Rank	First	2-5 times	5-10 times	10 or more	Total
Low	12	15	15	18	60
Medium	60	88	39	54	241
High	17	22	17	9	65
Total	89	125	71	81	366

Chi-square statistic=9.322, df=6, p=.1560

Hypothesis 5

A visitor's knowledge of site-specific environmental and ecological phenomenon is independent of the number of visits to the recreation area as measured by the instrument used in this study of Illinois River floaters.

As discussed with hypothesis 4, each respondent was ranked as low, medium or high knowledge within the specific ecology knowledge domain. The number of respondents within each rank for the specific ecology knowledge domain were summed for each time-visited category as indicated by post-float question 2 and entered into SAS.

Utilizing SAS, a chi square analysis performed on the specific ecology knowledge domain 2 and number of visits to the river showed no significance (p=.6400) at the .05 level of significance (Table X). Therefore, there is insufficient evidence to reject hypothesis number five, suggesting that visitor knowledge within this knowledge domain is independent of the number of visits to the recreation area.

Table X

SPECIFIC ECOLOGY/TIMES VISITED CHI-SQUARE

(OBSERVED FREQUENCIES)

	Times Visited				
Knowledge Rank	First	2-5 times	5-10 times	10 or more	Total
Low	15	17	9	8	49
Medium	82	83	41	35	241
High	21	22	16	17	76
Total	118	122	66	60	366

Chi-square statistic=4.274, df=6, p=.6400

Hypothesis 6

A visitor's knowledge of river management mandate is independent of the number of visits to the recreation area as measured by the instrument used in this study of Illinois River floaters.

As discussed with hypotheses 4 and 5, each respondent was ranked as low, medium or high knowledge within the management mandate knowledge domain. The number of respondents within each rank for the management mandate knowledge domain were summed for each time-visited category as indicated by post-float question 2 and entered into SAS.

Utilizing SAS, a chi square analysis performed on the management knowledge domain and number of visits to the river was significant (p=.0140) at the .05 level of significance (Table XI). Therefore, there is sufficient evidence to reject hypothesis number six, suggesting that visitor knowledge of management mandate is dependent upon the number of visits to the recreation area.

Table XI

MANAGEMENT MANDATE/TIMES VISITED CHI-SQUARE

(OBSERVED FREQUENCIES)

	Times Visited				
Knowledge Rank	First	2-5 times	5-10 times	10 or more	Total
Low	17	11	4	6	38
Medium	74	87	52	30	243
High	25	25	10	25	85
Total	116	123	66	61	366

Chi-square statistic=15.996, df=6, p=.0140*
* significant at alpha=.05

Summary

In addition to the description of recreational floaters to the Illinois River as ascertained by the knowledge and demographic questions of the pre-float questionnaire, and the satisfaction, reasons for visitation and visitor comment portions of the post-float questionnaire, several conclusions can be reached. There was no significant correlation between the level of knowledge of either general ($r = -.0946$, $p = .0641$) or site-specific ecology ($r = .0696$, $p = .1737$) and the number of times a recreational floater visited the river corridor as determined by the instrument used in this study. This suggests that, in general, a recreational floater's knowledge within either of these knowledge domains does not appear to be related to the number of visits to the river corridor. However, there was a weak but significant positive correlation between the level of knowledge of management mandate and the number of times a recreational floater visited the river corridor ($r = .1220$, $p = .0167$). This significant positive correlation suggests that, in general, a recreational floater's knowledge of management rules, regulations, objectives and facts is positively related to an increasing number of visits to the river corridor.

The chi-square analyses performed between knowledge of general (chi-square statistic=9.322, $p = .1560$) or site-specific ecology (chi-square statistic=4.274, $p = .6400$) and the number of times a recreational floater visited the river corridor was not significant as determined by the instrument used in this study. This suggests that, in general, a visitor's level of knowledge within either of these knowledge domains is independent of the number of visits to the river corridor. The chi-square analysis performed between knowledge of management mandate and the number of times a

recreational floater visited the river corridor was significant (chi-square statistic=15.996, p=.0140). This significant chi-square analysis suggests that, in general, a recreational floater's level of knowledge of management rules, regulations, objectives and facts is dependent upon the number of visits to the river corridor.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary of the Study

This investigation provides a more thorough understanding of visitors to the Illinois River resource than was previously available. Authors such as Manning et al. (1993), Stankey et al. (1985) and others have argued that the state of the recreation visitor must be known if informed managerial decision-making is to occur.

The purpose of this study was to reveal, through data collection and analysis, characteristics of recreational floaters to the Illinois River which may be important in future resource planning. Data collection was accomplished by utilizing a pre and post-float questionnaire between the months of May and September, 1999.

The participants of this study were recreational floaters to the Illinois River who were at least 18 years of age. Participants were selected from five professional float outfitters who agreed to participate in the study.

The pre-float segment of the data collection instrument evaluated visitors knowledge of general ecology, knowledge of site-specific ecology and knowledge of river management mandate. The pre-float instrument was also utilized to gather visitor demographics. An interdisciplinary panel of Oklahoma State University faculty

members, Illinois River management, investigator and others developed the questions in the knowledge section of the pre-float questionnaire. This panel, with information from previous investigation of Illinois River visitors, provided guidance for the final selection of pre-float demographic questions. The post-float segment of the instrument evaluated visitor satisfaction levels with respect to the overall float experience, the physical river corridor environment and the quality and effort of river management and outfitters used in the study. The post-float questionnaire provided space for respondents to write suggestions to make the river recreation experience more enjoyable, and also required them to identify, from a list of activities, the three most and least important reasons why they visited the river corridor. The investigator, advisory faculty from Oklahoma State University, Illinois River management and information from a previous investigation of Illinois River visitors guided the final selection of post-float questions.

A total of 385 pre-float questionnaires were administered. Of these, nineteen (19) were eliminated by the investigator due to an obvious lack of participant effort and thirty-eight (38) provided no follow up address for post-float mail out. A total of three hundred twenty eight (328) post-float questionnaires were sent to participants. Twenty-one (21) post-floats were returned to the investigator due to improper address. Two hundred sixty five (265) follow up post-floats were sent to participants who were delinquent in responding. A total of one hundred thirty six (136) completed post-float questionnaires were received for a response rate of 41.5%.

Three hundred sixty six (366) pre-float questionnaires were graded to obtain the number of correct responses out of four for each knowledge domain. The scores were

entered into a SAS program to obtain a mean and standard deviation for each knowledge domain.

The one hundred thirty six (136) completed post-float questionnaires were matched to each respondent's pre-float responses. Respondent's scores from each knowledge domain and number of times visited were entered into SAS and a Spearman rho correlation performed. The statistics associated with the Spearman rho correlations are designed to estimate the degree of relatedness between two variables. All correlations were performed at the .05 level of significance.

The one hundred thirty six (136) completed post-float questionnaires were again matched with each respondent's pre-float responses. Each respondent was ranked as low knowledge, medium knowledge or high knowledge by utilizing the mean score and standard deviation for all respondent scores within each knowledge domain. The number of respondents within each rank were summed for each time-visited category and entered into SAS. A chi square analysis was performed to determine the dependence or independence of the two variables. All chi square analyses were performed at the .05 level of significance.

The demographic section of the pre-float questionnaire was designed to obtain personal information about recreational floaters to the river. The demographic questions ascertained information pertaining to: number of visits to the Illinois River, gender, education level, location of stay, number of nights spent in area, number of people in group, amount of money spent on floating, fuel, food and drink, lodging and other recreation and total household income.

The satisfaction section of the post-float questionnaire was designed to ascertain satisfaction levels regarding specific aspects of the float experience as well as within the satisfaction domains. Satisfaction responses for each of the one hundred thirty six (136) completed post-float questionnaires were entered into a spreadsheet and means calculated on a per question and per domain basis. The post-float provided blank space for visitor suggestions, concerns and comments, and these comments were categorized and totaled. Additionally, the post-float required participants to identify the three most and least important reasons for visiting the river. The responses were summed within each category for each importance rank, "1," "2," and "3."

The pre and post-float questionnaires were designed to answer the following research questions:

1. What are the knowledge levels of visitors to the area with respect to general ecology, site-specific ecological phenomena and river management mandate?
2. What are the major demographics of visitors to the recreation area?
3. What are the satisfaction levels of visitors to the area with respect to the recreation experience, recreation setting and river management and outfitter effort and mandate?
4. What are the suggestions, concerns and comments of visitors to the area with respect to the recreation experience?
5. What are the most important and least important reasons visitors visit the recreation area?

The pre and post-float questionnaires were designed to specifically evaluate the following hypotheses:

1. There is no significant correlation between knowledge of general environmental or ecological principles among Illinois River floaters as measured by the instrument used in this study and number of visits to the river corridor.
2. There is no significant correlation between knowledge of environmental characteristics specific to the Illinois River watershed among Illinois River floaters as measured by the instrument used in this study and number of visits to the river corridor.
3. There is no significant correlation between knowledge of management goals, objectives, rules and facts among Illinois River floaters as measured by the instrument used in this study and number of visits to the river corridor.
4. A visitor's knowledge of general environmental and ecological principles is independent from the number of visits to the recreation area as measured by the instrument used in this study of Illinois River floaters.
5. A visitor's knowledge of site-specific environmental and ecological phenomenon is independent from the number of visits to the recreation area as measured by the instrument used in this study of Illinois River floaters.
6. A visitor's knowledge of river management mandate is independent from the number of visits to the recreation area as measured by the instrument used in this study of Illinois River floaters.

Discussion of Findings

Based on the data presented in Chapter IV, the findings of the study are as follows:

1. An average score of 1.5 out of 4 (std. dev. 1.1) was obtained for the general ecology knowledge domain. An average score of 2.6 (std. dev. 1.0) was obtained for the specific ecology knowledge domain. An average score of 2.7 (std. dev. 1.0) was obtained for the management mandate. These results from the general ecology domain are consistent with the literature (Kiernan 1995 and others), suggesting a generally poor public understanding of basic ecological and/or environmental concepts. The sampling group performed, on average, greater than one (1) point higher on the specific ecology domain than on the general ecology domain. This jump in average can likely be attributed to news media coverage of local environmental controversy surrounding the river. The sampling group also performed, on average, greater than one (1) point higher on the management mandate domain than on the general ecology domain. These results possibly stem from the OSRC's interpretive efforts within the river corridor in terms of signage and law enforcement officer-visitor interactions.

2. First time visitors made up 30.7% of participants in the study, 33.9% had visited 2-5 times before, 19.2% had visited 5-10 times before and 16.6% had visited 10 or more times prior to being sampled. While the investigator acknowledges the instrument error in visit intervals, that is, there is overlap between 2-5 times, 5-10 times and 10 or more times, it is clear that the recreation experience attracts repeat visitors. The Illinois

River resource represents one of the few river recreation areas of its kind in east central Oklahoma, and is therefore not surprising that the resource attracts repeat visitors.

3. Males made up 49.8% of the participants in the study, females comprised 50.2% of those sampled. This male-female ratio is similar to that found within the public at large.

4. Seven percent of the participants in the study had not completed high school, 38.0% had high school diplomas, 6.0% had Vo-Tech degrees, 16.1% had Associates degrees, 19.9% had Bachelors degrees, 10.1% had Masters degrees, 0.95% had Doctorate degrees and 1.9% had Professional degrees. The sampling group was, overall, well educated, with 93% of those sampled possessing at least a high school diploma.

5. Of those sampled, 17.5% spent the night in private camping areas, 20.9% stayed in public camping areas, 6.7% stayed in a hotel or motel in Tahlequah or other city, 10.1% stayed at one of the outfitters along the river, 9.2% stayed at the home of family or friends and 35.5% did not respond to the question. It is concluded that a large portion of those failing to respond to the question did so because they were not spending the night. The instrument failed to provided "not spending the night" as a selection option. At least 48.5% of those spending the night stayed within the river corridor, suggesting the need for river and outfitter managers to continue to provide clean, accessible and affordable stay options near the river.

6. An average of 9.67 (std.dev. 5.67) people were in each group per trip. The maximum group size was one hundred six (106), the minimum was one (1). Sixty three (63) participants did not respond (17.2%). A distribution of group sizes can be found in Table IV, page 67. It is important to note that due to the potential duplication of

responses on the questionnaire, this summary may be unreliable. Despite the difficulty associated with this summary, it is obvious that the distribution of group sizes is highly variable and that recreation on the Illinois River is a group endeavor.

7. An average of $35.06 spent per person on floating and/or outfitters, $14.13 spent on gasoline for the trip, $32.72 spent on food and drink, $12.30 spent on lodging, $7.90 spent on other recreation. Total per-capita expenditure was $102.11. Seventeen (17) participants did not respond (5.5%). Approximately 34.2% of the total per person expenditure went toward floating and/or outfitter costs, 13.9% went toward gasoline for the trip, 32.3% went toward food and drink, 12.0% went toward lodging and 7.6% went toward other recreational costs. A substantial majority of the personal expenditure (66.5%) went toward floating expenses and food and drink for the trip. Visitor comments and visitor satisfaction ratings suggest that recreational floater to the Illinois River have issues with the cost of the float experience. It is interesting to note that only floating cost was commented on by floaters as being too high, even though these expenditures constituted only about 35% of the total personal expenditure per trip. No mention was made of gasoline, food and drink or lodging costs within the visitor comment section.

8. Of those sampled, 13.5% of the respondents did not know how much their annual household income was, 13.2% made less than $20,000, 13.2% made between $20,000 and $29,999, 9.3% made between $30,000 and $39,999, 9.3% made between $40,000 and $49,999, 13.2% made between $50,000 and $74,999, 10.3% made between $75,000 and $99,999 and that 9.3% indicated making $100,000 per year or more. Twenty seven (27) participants did not respond (8.7%). Over half of those sampled earned annual household incomes of $30,000 per year or more. However, in 1994, Hawthorne et al. found that

38% of Illinois River floaters sampled made annual household incomes of $30,000 per year or more. The discrepancy may be due to an overall higher income now earned by the general population. However, it may reflect rising costs associated with the float experience, which, consequently, attracts higher wage earners.

9. An average satisfaction rating of 3.72 out of 5 was achieved per person for the general satisfaction domain. The general satisfaction domain average (3.72) resides between "neutral" and "satisfied," or "3" and "4" as indicated by the Likert scale utilized for this study. The general satisfaction domain average was calculated as an average of all scores on the post-float satisfaction section, and reflects both the relatively high environmental satisfaction domain rating (3.97) and the relatively lower management mandate domain rating (3.53).

An average satisfaction rating of 3.97 was achieved for the environmental satisfaction domain. The environmental satisfaction domain average (3.97) resides close to "satisfied," or "4" as indicated by the Likert scale used in this study. The relatively high score within the environmental satisfaction domain reflects generally high scores on post-float question three "Depth and flow of the river," with a mean of 4.0, question five, "Scenic quality of the valley," with a mean of 4.2 and question six "Naturalness of the Illinois River corridor," with a mean of 4.1. Recreational floaters to the Illinois River are generally satisfied with the environmental conditions found within the river corridor. However, according to Solomon and Hansen (1974) and Hammit and McDonald (1983), floaters may fail to notice a degraded environment, or characteristics of the degradation.

An average satisfaction rating of 3.53 was achieved for the mandate satisfaction domain, again indicating a satisfaction rating between "neutral" and "satisfied." The

relatively low satisfaction within the mandate satisfaction domain was a result of generally low ratings on post-float question seven, "Cost of the float experience," with a mean of 3.3, question eleven, "Location of rest rooms along the Illinois River," with a mean of 2.8 and question twelve, "Number of rest rooms along the Illinois River," with a mean of 2.8. The satisfaction rating for both the location and number of rest rooms along the Illinois River is generally rated below the overall mean satisfaction. However, there are significant difficulties associated with increasing the number of easily accessible restrooms within a river corridor prone to periodic flooding. Signs indicating the location of restrooms along the river could, if added, temper the relatively poor satisfaction ratings with respect to the location and number of restrooms. A summary of satisfaction means can be found in Table V, page 71 and in Table XII on the following page.

10. Table XII summarizes the relative order of satisfaction by utilizing the mean respondent satisfaction scores per satisfaction question (order is shown from highest satisfaction to lowest satisfaction). Despite several satisfaction categories which fell below the overall mean satisfaction score of 3.72 (mean of all fifteen questions), respondents indicated a high satisfaction level of "overall experience on the Illinois River," with a score of 4.5, or between "satisfied" and "very satisfied." These results indicate that while management has no immediate cause for radical changes with respect to the resource, certain aspects should be addressed to ensure the continuation of a satisfying recreational experience.

Table XII

RELATIVE SATISFACTION ORDER

Relative Satisfaction Rank	Post-Float Satisfaction Question	Mean Satisfaction Score
1	1. Overall experience on the Illinois River	4.5
2	5. Scenic quality of the valley	4.2
3	6. "Naturalness" of the Illinois River Corridor	4.1
4*	2. Depth and flow of the river	4.0
4*	14. Condition of the equipment for our float experience	4.0
5	15. Condition of the property adjoining the river	3.9
6**	4. Appearance of the river banks	3.8
6**	10. Behavior of other boaters seen during the float trip	3.8
7***	2. Clarity of the water in the Illinois River	3.7
7***	8. Amount of trash seen in and along the Illinois River	3.7
7***	9. Number of other boaters seen during the float trip	3.7
8	13. Information provided by the outfitter	3.6
9	7. Cost of the float experience	3.3
10****	11. Location of rest rooms along the Illinois River	2.8
10****	12. Number of rest rooms along the Illinois River	2.8

* Means and ranks are the same.
** Means and ranks are the same.
*** Means and ranks are the same.
**** Means and ranks are the same.

11. A complete numeric summary of respondent comments regarding changes they would suggest to make a visit to the Illinois River more enjoyable can be found in Table VI, page 72. All comments can be found, as received by the investigator, in Appendix H. The five most common respondent comments received by the investigator are: "too

expensive/lower the prices," comprising nineteen (19) or 12.8% of the comments; "too few restrooms/add more restrooms," comprising fifteen (15) or 10.1% of the comments; "too much trash/clean up trash," comprising ten (10) or 6.7% of the comments; "poor visitor and/or floater information provided by outfitter," comprising ten (10) or 6.7% of the comments; "too many rowdy people," comprising ten (10) or 6.7% of the comments. These comments are consistent with the generally low satisfaction ratings obtained by the satisfaction section of the post-float questionnaire which indicated question seven, "Cost of the float experience," question eight, "Amount of trash seen in and along the Illinois River," question twelve, "Number of rest rooms along the Illinois River" and question thirteen, "Information provided by the outfitter" to fall below the overall satisfaction mean. Question ten "Behavior of other boaters seen during the float trip," obtained a mean satisfaction rating higher than the overall satisfaction mean on the satisfaction section of the post-float questionnaire, however, "too many rowdy people" still placed within the five most common respondent comments.

12. An examination was performed on each category of the most important reasons for visiting by summing the number of responses within each category for each importance rank, "1," "2," and "3." Table XIII summarizes the top three most important reasons for visiting the river as indicated by respondents. The category "Canoeing, rafting, tubing and kayaking" was the most important reason for visitation as indicated by respondents with a total of seventy seven (77) responses within the "1," "2" and "3" importance ranks. "Have a day of fun with friends, family" was the second most important reason for visitation with a total of seventy two (72) responses within the "1," "2" and "3" importance ranks. "Enjoy the natural environment" was the third most

important reason for visitation with a total of thirty seven (37) responses within the "1," "2" and "3" importance ranks. A full summary of responses can be found in Table VII, page 83. It was not surprising that " canoeing, rafting, tubing and kayaking" was chosen as the most important reason for visitation as those surveyed were individuals engaged in these activities. "Have a day with family and friends," being chosen as second most important reason for visitation, was expected to lie within the top three choices considering that a substantial majority of the floating activity occurs in groups. "Enjoy the natural environment," being chosen as the third most important reason for visitation, lends support for protecting the environmental integrity of the river corridor.

Table XIII

TOP THREE MOST IMPORTANT REASONS FOR VISITATION

Rank	Category	Number of respondents indicating this category to be the most important reason	Number of respondents indicating this category to be the second most important reason	Number of respondents indicating this category to be the third most important reason
1	Canoeing, rafting, tubing, kayaking	30	35	12
2	Have a day of fun with friends, family	39	16	17
3	Enjoy the natural environment	4	17	16

13. An examination was performed on each category of the least important reasons for visiting by summing the number of responses within each category for each importance rank, "1," "2," and "3." Table XIV summarizes the top three least important reasons for visiting the river as indicated by respondents. The category "Party hearty!"

was the least important reason for visitation, as indicated by respondents, with a total of forty four (44) responses within the "1," "2" and "3" importance ranks. "See the guys! See the girls!" was the second least important reason for visitation with a total of forty (40) responses within the "1," "2" and "3" importance ranks. "Observe plants" was the third least important reason for visitation with a total of twenty eight (28) responses within the "1," "2" and "3" importance ranks. A full summary of responses can be found in Table VII, page 83. Considering the festive atmosphere that is often present within the river corridor, floater selections for the first and second least important reasons for visitation, "party hearty" and "see the guys/see the girls," was unanticipated.

Table XIV

TOP THREE LEAST IMPORTANT REASONS FOR VISITATION

Rank	Category	Number of respondents indicating this category to be the least important reason	Number of respondents indicating this category to be the second least important reason	Number of respondents indicating this category to be the third least important reason
1	Party hearty!	31	9	4
2	See the guys! See the girls!	12	25	3
3	Observe plants	8	10	10

14. There was not a significant correlation between the general ecology knowledge domain and the number of visits to the river. If the Illinois River corridor provided effective opportunities for learning about the natural environment, there may be a greater likelihood that repeat visitors would expand their knowledge of the natural environment

with increasing visitation. According to the instrument used in this study, however, the level of environmental knowledge does not appear to increase with an increasing number of visits to the river corridor. Arcury (1990) suggested that individuals who know about a subject appreciate the subject more than those who know it poorly or not at all. If Arcury is correct, then an expanded environmental education program within the river corridor might help to instill in visitors the stewardship ethic. This ethic would likely result in the reduction of litter found in and around the river, a common problem commented on by visitors. It is suggested throughout the literature (Kiernan 1995 and others) that the public possesses a generally low level of knowledge with respect to basic ecological and environmental concepts. This study was consistent with the literature in that respect.

15. There was not a significant correlation between the specific ecology knowledge domain and the number of visits to the river. As with the discussion above, it does not appear that the level of knowledge of environmental and ecological phenomena specific to the Illinois River corridor is significantly related to an increasing number of visits to the river corridor.

16. There was a significant correlation between the management mandate knowledge domain and the number of visits to the river. Unlike the level of visitor knowledge of either general or specific ecology, the level of visitor knowledge of management mandate appears to be positively related to an increasing number of visits to the river corridor. This positive relationship is likely due to the OSRC's interpretive efforts within the river corridor in the form of signs and law enforcement-visitor interactions, and is an indication that management's message is being received by the

visiting public. According to Knudson et al. (1995), it is in management's interest to effectively communicate their resource goals and objectives to the visiting public to cultivate the support needed for the agency.

17. A chi square analysis performed on the general knowledge domain and number of visits to the river was not significant. The result of this analysis suggests that the level of visitor knowledge of general ecology, whether low, medium or high, is independent from the number of time the visitor visits the river corridor. That is, visits to the river corridor are not, according to the instrument used in this study, influencing a visitor's level of knowledge of general ecology. Visitors do not appear to depart from the river corridor with any greater knowledge of the environment than when they arrived for their recreation experience. Dunlap and Heffernan (1975) suggest that outdoor recreation provides interaction with nature that has the potential to influence attitudes and perceptions toward the environment. For this reason, the educational capacity of the resource should be utilized to promote learning and the fostering of the stewardship ethic.

18. A chi square analysis performed on the specific ecology knowledge domain and number of visits to the river was not significant. As with the prior discussion, it does not appear as though visits to the river corridor are influencing a visitor's level of knowledge of specific ecology.

19. A chi square analysis performed on the management mandate knowledge domain and number of visits to the river was significant. The results of this analysis suggest that the level of visitor knowledge of management mandate, whether low, medium or high, is dependent upon the number of times the visitor visits the river corridor. That is, a visitor's level of knowledge of management mandate depends upon the number of times

a visitor visits the river corridor. As with the prior discussion (number 16), Knudson et al. (1995) considers it paramount that visitors to a resource are exposed to and comprehend management's message. It appears as though the management of the Illinois River has been effective at disseminating their rules, facts, regulations and goals to the visiting public. That is, visitors are learning about management while engaged in floating activities.

Conclusions

Several conclusions can be reached as a result of this study. These conclusions are based upon the sample of Illinois River recreational floaters used in this investigation.

There is evidence suggesting that recreational floaters on the Illinois River are not being exposed to educational information of a quality or quantity sufficient to increase their knowledge of general or specific ecology of the river corridor with an increasing number of visits. However, there is sufficient evidence to suggest that visitors are being exposed to educational information sufficient to increase their level of knowledge of management's rules, objectives, regulations and facts with an increasing number of visits.

The base of general and site-specific ecological knowledge that visitors bring to the river corridor appears to be independent of their visits to the corridor. That is, the level of general and specific ecological knowledge the visitor possesses appears to be independent of any prior visits to the river corridor. Recreational floaters do, however, appear to be learning about management's rules, objectives, regulations and facts while

participating in floating activities on the river. Their level of knowledge of the river management mandate appears to be dependent upon previous visits to the river corridor.

Arcury (1990) and others acknowledge evidence suggesting that an increased level of environmental knowledge leads to an increase in positive environmental attitudes. The results of the knowledge assessment, correlation and chi-square analyses in this study indicate a need for increased interpretive effort so that Illinois River floaters are provided an opportunity to learn about the natural environment, thus fostering the stewardship ethic. Kiernan (1995) and others have cited the public's generally poor understanding of environmental facts and concepts. The knowledge assessment of this investigation supports these authors. However, the Illinois River represents a unique opportunity for learning that should be utilized to teach and to strengthen the resolve toward solving environmental problems.

Although visitor satisfaction was varied, clear trends appeared. In general, visitors indicated an average satisfaction rating of between "neutral" and "satisfied" for each of the three satisfaction domains: general, environmental and management mandate satisfaction. Several individual satisfaction question means fell below the overall mean satisfaction.. Floaters are, in general, less satisfied with the cost of floating, with the amount of trash along the river, with the number of other boaters seen, with the location and number of rest rooms and by the information provided to them by the outfitter than they are with the overall float experience. The mean rating on the overall float experience (4.5) indicates that, despite some aspects of the float experience with room for improvement, visitors are, in general, satisfied with the experience. This notion is supported by the fact that the majority of floaters on the Illinois River are repeat visitors.

However, readers are cautioned that the relatively high overall satisfaction rating found within this study might be attributed to the phenomena of recreational displacement as described by Shelby et al. (1988), Robertson and Regula (1994) and others. The crux of this concept is that visitors to a particular recreation site who are not satisfied with the recreational experience will choose other sites and will eventually be replaced with visitors who are satisfied with the experience. That is, the dissatisfied visitor becomes, over time, under represented, and those satisfied, over represented. The fact that repeat visitors make up the majority of floaters on the Illinois River suggests that recreational displacement is likely occurring with regard to this recreational resource.

It is the stated goal of the OSRC to "Provide the opportunity for a high-quality recreation experience while protecting the river's outstanding resources and recognizing the needs of river outfitters and individual users." As such, it is important to credit those aspects of the float experience attaining high levels of satisfaction while noting the areas of low satisfaction, which, if not addressed by management, may result in a significant diminishing of overall recreational floater satisfaction in the future.

It is clear that the most important reasons recreational floaters visit the Illinois River are: canoeing and other floating, spending time with family and friends and enjoying the natural environment. On the other hand, partying, seeing the opposite sex and observing plants were rated as the least important reasons for visitation. The three most important reasons for visitation are compatible with the goals and objectives set forth by the OSRC, and should continue to be priorities in management. River management and outfitters should make every effort to preserve the integrity of the river corridor environment, as it is a strong motivating factor for visitation.

The majority of Illinois River floaters are repeat visitors floating in groups, possessing at least a high school education and who earn a yearly household income of $30,000 or more per year. Over half of the floaters on the river spend at least one night in the area, and nearly half of those floaters spend the night in or near the river corridor. Floaters generally have issue with the expense associated with the float experience as concluded by the number of related visitor comments and the relatively low satisfaction rating with the satisfaction question "cost of the float experience." Over two-thirds of the $102.11 per capita expenditure goes toward floating and food and drink.

Recommendations

This study revealed attributes of recreational floaters to the Illinois River which managers and outfitters might utilize to garner support for their agency and to provide the best possible recreational opportunities both now and into the future. The planning process for a recreational resource such as the Illinois River must necessarily include such an investigation if sound decision making is to occur.

The findings and conclusions of this study lead to the following recommendations:

1. Increase the level of interpretive effort within the river corridor, specifically targeting river floaters, to increase the level of environmental and ecological knowledge. This recommendation is founded on the suggestion by Arcury (1990) that individuals who know about a subject appreciate that subject more than those who know very little

about a subject. In short, increasing the level of environmental and ecological interpretation has the potential to build support for protecting the resource.

2. Increase the interpretive effort with respect to river management's goals, objectives, facts, rules and regulations to build support for the agency and to help create a safe, healthy and enjoyable recreation environment that is preserved for future generations.

3. Repeat this study in the future to determine the consequences of an expanded interpretive effort on visitor knowledge within the three knowledge domains.

4. Create a recreational setting within the Illinois River corridor that is conducive to learning and which instills in visitors a respect for the resource.

5. Perform a factor analysis to determine which, if any, knowledge questions on the pre-float questionnaire, and satisfaction questions on the post-float questionnaire can be eliminated to reduce the redundancy of the instrument.

Concluding Comments

"...A technological people who ignore the natural processes and resources that support their civilization will likely make political and personal decisions that damage the environment. Regional, state and national parks offer excellent types of classrooms" (Knudson et al. 1995, p. xiv). With an increasingly urbanized population, visits to outdoor recreation become, for many, the only contact with the natural environment. As a consequence, visits to places such as the Illinois River become exceedingly important in fostering an ideology of environmental appreciation. It is for this reason that managers of

such resources should ensure that visitors are exposed to an accessible, clean and healthy environment that provides opportunity for learning and personal growth.

Ensuring that an outdoor recreational environment provides opportunities for learning and personal growth implies a need to determine the baseline of visitor knowledge, expectations, motivations for visitation and satisfaction levels. In short, the state of the visitor must be objectively evaluated if sound management decisions are to be made. This study has revealed visitor attributes which, hopefully, can be utilized to promote efficient and well-informed resource decisions well into the future.

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APPENDIXES

APPENDIX A

DATA COLLECTION MATERIALS

Interview Arrangement (phone call)

Introduction: Hello, my name is John Jett, I'm a graduate student at Oklahoma State University. I will be conducting research on visitors to the Illinois River this summer and would like to include your visitors as part of the study. Can we set up a time to go over the study?

Outfitter Interview Points and Questions (in person).

Introduction: Hello, my name is John Jett, I'm the Oklahoma State University graduate student you spoke with on the phone. As I told you on the phone, I will be here this summer collecting information from river visitors. Let me first tell you a little about the study and then I'll ask you a few questions.

- The study will run from May 31 until around September 1.
- I will be giving river visitors a brief questionnaire to fill out (show them the questionnaire).
- The people who receive the questionnaire will be your customers.
- I will distribute the questionnaire while on the bus en route to the put in location and pick them up when visitor are departing.
- My goal is to make the process quick and easy, as I do not want to harass your customers.
- If at any time you or your staff have questions or concerns it is important to me that we speak.
- I will be here at most four times per week, usually only once or twice.
- Do you have any questions regarding the research or process?
- Is this something you would be interested in?
- Please take a look at both questionnaires and let me know of any questions or comments you may have.

Script for Respondent Participation Prior to Departure for Put-In.

Hello, my name is John Jett, I am a graduate student at Oklahoma State University. I am doing research on visitors to the Illinois River and would like for you to help me out. I have a short questionnaire for you to fill out if you are interested in doing so. You will be sent a follow up questionnaire in the mail. I am the only person who will have access to your information. Your anonymity is guaranteed. You must be at least 18 years of age to participate. Please let me see a show of hands of those who are interested.

Post-Float Cover Letter.

Oklahoma State University
College of Education
Stillwater, OK 74078

Leisure Studies
103 Colvin Center
FAX: (405) 744-6507
E-mail: Lowell@okstate.edu

«First» «Last»
«Address»
«City», «State» «Zip»

Dear «First»:

During your recent visit to the Illinois River you participated in the first half of a research project designed to better understand river users. As researchers at Oklahoma State University we greatly appreciate your participation.

Enclosed is a short questionnaire to evaluate your satisfaction level of various aspects of the river experience. Please take a few minutes to answer the questionnaire, providing any comments you feel are necessary.

This phase of the research represents the last time you will be contacted! Your name and address will not be shared with anyone. All responses are held in strict confidence.

Thank you very much for participating in this study. Please remember to tape or staple the postage-paid survey together and drop it in the mail.

Sincerely,

John Jett
Graduate student

Lowell Caneday, Ph.D.

Post-Float Follow Up Cover Letter.

Oklahoma State University
College of Education
Stillwater, OK 74078

Leisure Studies
103 Colvin Center
FAX: (405) 744-6507
E-mail: Lowell@okstate.edu

«First» «Last»
«Address»
«City», «State» «Zip»

Dear «First»:

You may have forgotten or tossed it aside, so here's another chance to participate in the Illinois River research project. Enclosed is another Post-float questionnaire. Please answer the questions to the best of your ability, providing any comments you feel are necessary.

This study depends on YOU! The validity of this study is dependent upon your responses. The Oklahoma Scenic Rivers Commission will be presented the results of this research...your chance to make a difference!

Please take a couple of minutes to fill out the questionnaire, and remember that your name and address will not be shared with anyone. Responses are held in strict confidence.

Thank you very much for participating in this study. Please remember to tape or staple the postage-paid survey together and drop it in the mail.

Sincerely,

John Jett
Graduate student

Lowell Caneday, Ph.D.

The Illinois River Floater Survey
1999

PRE - FLOAT
Oklahoma State University
Lowell Caneday, Ph.D.
John Jett, Masters Student
1999

Are you floating the river today?

No→ Please stop! Return the survey to the researcher.

Yes→ Are you at least 18 years of Age?
If no please stop! Return the survey to the researcher.
If yes please read:

We are interested in learning more about your understanding of the Illinois River environment and your perception of today's river experience. Please take the time to answer all questions to the best of your ability. Your answers are important!

Participation in this survey is completely voluntary. Your assent to participate is demonstrated by completion of the survey.
No personally identifiable information will be reported to anyone. All responses will be reported in aggregate form. The Oklahoma State University Institutional Review Board has approved this research.

The study is divided into two sections:

1. The pre-float survey (what you have in your hand).
2. The post-float survey (to be mailed to you in several days).

Please note that on page 5 we ask for an address to reach you by mail. The mailed component of the survey is essential to the research and your input is very important to us. If you have any questions, concerns or comments please ask the person distributing the survey or contact us at:

- Oklahoma State University - (405) 744-9335
- Or (405) 372-9496

Thank you for participating!

Pre-Float Survey

Directions: Read each question carefully. Place a check mark by the most appropriate answer for each item. Please check only one.

1. The Illinois River is managed by:

A.	Save the Illinois River (STIR).
B.	The Oklahoma Scenic Rivers Commission.
C.	The National Park Service.
D.	The Nature Conservancy.

2. One of the best indicators of water quality on the Illinois River is:

A.	Clear water.
B.	Numbers of green sunfish.
C.	Diversity of aquatic life.
D.	Increased numbers in recreational floaters.

3. The place in an ecosystem that a specific organism and only that organism fills is:

A.	Habitat.
B.	Niche.
C.	Community.
D.	Interaction.

4. During most of the summer a slimy substance can be felt on the rock bottom of the Illinois River. This slimy substance is most likely:

A.	Fungus.
B.	Algae.
C.	Detritus.
D.	Limestone deposit.

5. A plant or other organism considered to be at the bottom of the food chain is called a:

A.	Successional producer.
B.	Climax producer.
C.	Primary producer.
D.	Secondary producer.

6. An interaction that occurs when two living organisms associate closely with each other and both receive benefit from the relationship is called:

A.	Predation.
B.	Neutralism.
C.	Symbiosis.
D.	Tertiary interaction.

7. One of the goals of the Illinois River Management Plan is to:

A.	Install telephones for safety along the river bank.
B.	Reduce the amount of runoff from poultry farms in the area.
C.	Increase the number of visitors floating the river.
D.	Restrict the rights of landowners for use of property.

8. When a community of living organisms has reached a stable stage and does not undergo any further major changes:

A.	This is called ecological succession.
B.	This becomes an ecological community.
C.	This becomes a habitat.
D.	This becomes a climax community.

9. Lake Tenkiller, an impoundment downstream of this location on the Illinois River, experiences summer algae growth as a result of:

A.	Decaying leaves in the water.
B.	Reduced wind mixing.
C.	Nutrients from animal and human waste.
D.	A decline in chlorine levels.

10. If cattle are allowed to walk to the water's edge on the banks of the Illinois River, they can damage the riparian vegetation and cause streambank:

A.	Succession.
B.	Stability.
C.	Sensitization.
D.	Erosion.

11. River management would like to be involved in which kind of relationship with local landowners:

A.	They want to buy out landowners to expand the river corridor.
B.	They would like to enter into a partnership to protect the resource.
C.	They want to encourage local landowners to develop the areas around the river.
D.	They want to encourage landowners to sell their property to the National Park Service.

12. River management prohibits the use of ____ while in the Illinois River corridor.

A.	Radios.
B.	Mono-filament fishing line.
C.	Styrofoam.
D.	Aluminum beverage cans.

Information About Yourself

Please provide us with a little information about yourself. Your responses will be held in strict confidence.

1. Please write your name and address. This will provide the contact address for the post-float survey to be mailed to you. (Please be assured that only the researchers have access to this information).

Name:
Address:
City: State: Zip:

2. How many times have you been to the Illinois River?

	This is my first trip.
	Two to five times before.
	Five to ten times before.
	Ten or more times.

3. Please indicate your sex.

M	F

4. What is the highest level of education you have completed? (check one)

	Have not completed high school		Bachelor's degree (4-year college)
	High school graduate		Master's degree
	Vo-tech degree		Doctorate degree
	Associates degree		Professional degree

5. If you spent the night in the area, where did you stay on **this** trip? (check one)

	In a private camping area.
	In a public camping area.
	In a hotel/motel in Tahlequah or other city.
	At one of the outfitters along the river.
	Home of family/friends.

6. How many nights will you spend in the area on **this** trip?
	Actual number.

7. How many people are in your group for **this** trip?
	Actual number.

8. How much money did you spend on each of the following items for **this** trip to the Illinois River? Round to nearest dollar.

	Floating/outfitters.
	Gasoline for trip to the River.
	Food and beverages.
	Lodging.
	Other recreation.

9. What is your total household annual income before taxes? (check one)

	Do not know		$40,000 to $49,999
	Less than $20,000		$50,000 to $74,999
	$20,000 to $29,999		$75,000 to $99,999
	$30,000 to $39,999		$100,000 or more

Thank you very much for participating in this study. Have a great day on the Illinois River.

The Illinois River Floater Survey
1999

POST - FLOAT
Oklahoma State University
Lowell Caneday, Ph.D.
John Jett, Masters Student
1999

Post-Float Survey

During your recent visit to the Illinois River, you completed a brief survey on knowledge of the river environment. We are interested in learning more about your perception of the river experience. Please take the time to answer all questions to the best of your ability. Your answers are important!

Participation in this survey is completely voluntary. Your assent to participate is demonstrated by completion of the survey. No personally identifiable information will be reported to anyone. All responses will be reported in aggregate form. The Oklahoma State University Institutional Review Board has approved this research.

Your cooperation is greatly appreciated.

If you have questions or concerns about this research, you may contact the investigator at:

- Oklahoma State University - (405) 744-9335
- Or (405) 372-9496

Upon completion of the survey, fold it. Then staple or tape the survey and drop it in the mail. Thank you for participating!

Post-Float Survey

Directions: Read each question carefully. Circle the most appropriate answer for each item.

Rate your level of satisfaction with each of the following items using the scale provided.

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
1. Overall experience on the Illinois River	VS	S	N	D	VD
2. Clarity of the water in the Illinois River	VS	S	N	D	VD
3. Depth and flow of the river	VS	S	N	D	VD
4. Appearance of the river banks	VS	S	N	D	VD
5. Scenic quality of the valley	VS	S	N	D	VD
6. "Naturalness" of the Illinois River corridor	VS	S	N	D	VD
7. Cost of the float experience	VS	S	N	D	VD
8. Amount of trash seen in and along the Illinois River	VS	S	N	D	VD
9. Number of other boaters seen during the float trip	VS	S	N	D	VD
10. Behavior of other boaters seen during the float trip	VS	S	N	D	VD
11. Location of rest rooms along the Illinois River	VS	S	N	D	VD
12. Number of rest rooms along the Illinois River	VS	S	N	D	VD
13. Information provided by the outfitter	VS	S	N	D	VD
14. Condition of the equipment for our float experience	VS	S	N	D	VD
15. Condition of the property adjoining the river	VS	S	N	D	VD

16. What changes would make a visit to the Illinois River more enjoyable for you?

17. From the following list, please identify the three **most** important and three **least** important reasons you have for visiting the Illinois River. Put a **1** by the most important reason, a **2** by the second most important reason, and a **3** by the third most important reason in the appropriate column. Follow the same pattern for the least important reasons for visiting the River.

Most Important	Reasons Given by Previous Visitors	Least Important
	Canoeing, Rafting, Tubing, Kayaking	
	Camping	
	Fishing	
	Picnicking	
	Photography	
	Observe wildlife	
	Sun-bathing (Get a tan!)	
	Get some exercise	
	Seek solitude	
	Meet new friends, make friends	
	Enjoy the natural environment	
	Have a day of fun with friends, family	
	Observe plants	
	See the guys! See the girls!	
	Party hearty!	
	Other: Please describe	

Thank you very much for your participation in this study. We greatly appreciate your assistance. Staple or tape the survey closed and place it in the mail.

APPENDIX B

INSTITUTIONAL REVIEW BOARD APPROVAL

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

Date: June 9, 1999 IRB #: ED-99-130

Proposal Title: "AN EVALUATION OF KNOWLEDGE, ATTRIBUTES AND SATISFACTION OF RECREATIONAL FLOATERS ON THE ILLINOIS RIVER"

Principal Investigator(s): Lowell Caneday
John Jett

Reviewed and Processed as: Expedited (Special Population)

Approval Status Recommended by Reviewer(s): Approved

Signature: Carol Olson

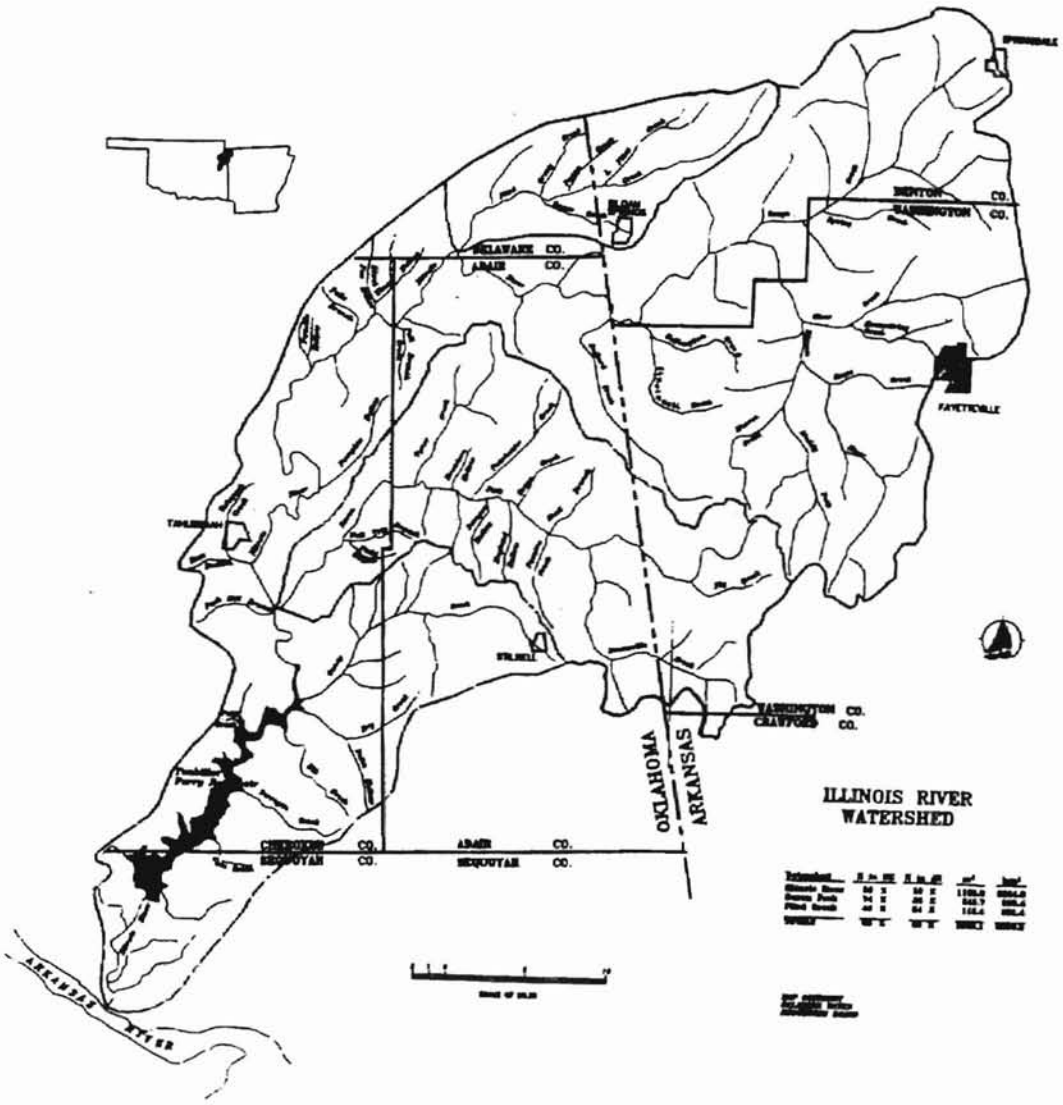
Carol Olson, Director of University Research Compliance

June 9, 1999
Date

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modification to the research project approved by the IRB must be submitted for approval. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

APPENDIX C

MAP OF ILLINOIS RIVER AND SURROUNDING AREA


DELAWARE CO.
ADAIR CO.
BENTON CO.
WASHINGTON CO.
FAYETTEVILLE
WASHINGTON CO.
CRAWFORD CO.
OKLAHOMA
ARKANSAS
CHEROKEE CO.
SEQUOYAH CO.
ADAIR CO.
SEQUOYAH CO.
ARKANSAS RIVER
ILLINOIS RIVER
WATERSHED

APPENDIX D

OUTFITTER SERVICES AND AMMENITIES

Outfitter Services

Outfitter	Canoes	Camping	RV-Hook up	Motel	Cabins	Group Lodge	Supplies	Food	Showers	Outdoor Activities	Inner tubes & Rafts
Arrowhead Camp	X	X	X		X		X	X	X	X	X
Cedar Valley Camp	X	X					X			X	
Diamondhead Resort	X	X	X	X		X	X	X	X	X	X
Eagle Bluff	X	X	X	X	X	X	X	X	X	X	X
Falcon Floats	X	X					X	X	X	X	X
Green River Floats	X								X		X
Hanging Rock Camp	X	X	X	X	X		X	X	X		X
Kamp Paddle Trails	X	X	X		X	X		X		X	
Peyton's Place	X	X			X	X	X	X	X	X	X
Riverside Camp	X	X	X		X	X	X		X	X	X
Sparrow Hawk Camp	X	X	X				X	X	X	X	X
Spencer Ridge Resort	X	X	X		X		X		X		
Tahlequah Floats	X	X					X		X		
Thunderbird Resort	X	X				X	X		X	X	X
War Eagle Recreation	X	X	X	X	X	X	X	X	X	X	X

Source: OSRC Floater Guide, 1998

Note: Eagle Bluff, Riverside Camp, Sparrow Hawk Camp, Tahlequah Floats and Thunderbird Resort were used for this study.

APPENDIX E

PRE-FLOAT INSTRUMENT DEVELOPMENT

AND VALIDITY PANELS

Pre-float Instrument Development Panel

Caneday, Lowell. Professor - Oklahoma State University.

Cross, Anne. Associate Professor - Oklahoma State University.

Fite, Ed. Administrator - Oklahoma Scenic Rivers Commission.

Jett, John. Investigator; Graduate Student – Oklahoma State University.

Jett, Marla. Registered Nurse.

Kuzmic, Tom. Professor - Oklahoma State University.

Wikle, Tom. Professor - Oklahoma State University.

Pre-Float Instrument Validity Panel

Caneday, Lowell. Professor - Oklahoma State University.

Cross, Anne. Associate Professor - Oklahoma State University.

Field, Charles. Graduate Student – University of Kansas.

Fite, Ed. Administrator - Oklahoma Scenic Rivers Commission.

Jett, John. Investigator; Graduate Student – Oklahoma State University.

Kuzmic, Tom. Professor - Oklahoma State University.

Wikle, Tom. Professor - Oklahoma State University.

APPENDIX F

POST-FLOAT INSTRUMENT DEVELOPMENT

AND VALIDITY PANEL

Post-Float Instrument Development Panel.

Caneday, Lowell. Professor – Oklahoma State University.

Fite, Ed. Administrator - Oklahoma Scenic Rivers Commission.

Jett, John. Investigator; Graduate Student – Oklahoma State University.

Kuzmic, Tom. Professor - Oklahoma State University.

Wikle, Tom. Professor - Oklahoma State University.

Post-Float Instrument Validity Panel.

Caneday, Lowell. Professor - Oklahoma State University.

Cross, Anne. Associate Professor - Oklahoma State University.

Field, Charles. Graduate Student – University of Kansas.

Fite, Ed. Administrator - Oklahoma Scenic Rivers Commission.

Jett, John. Investigator; Graduate Student – Oklahoma State University.

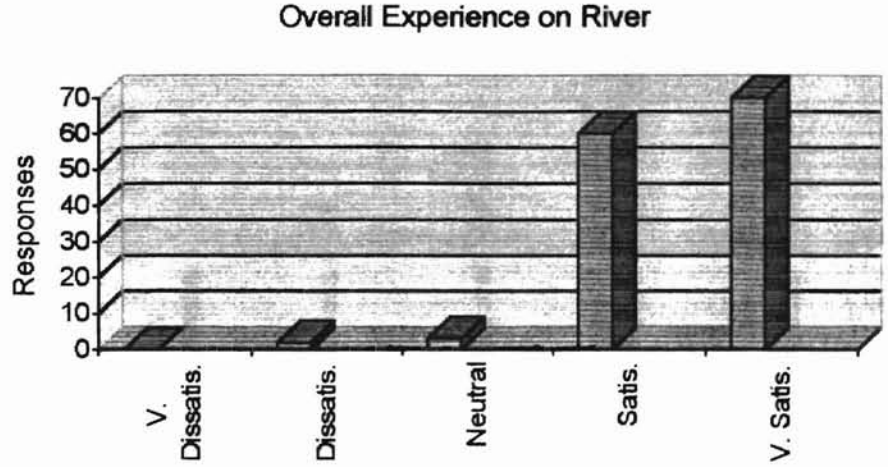
Kuzmic, Tom. Professor - Oklahoma State University.

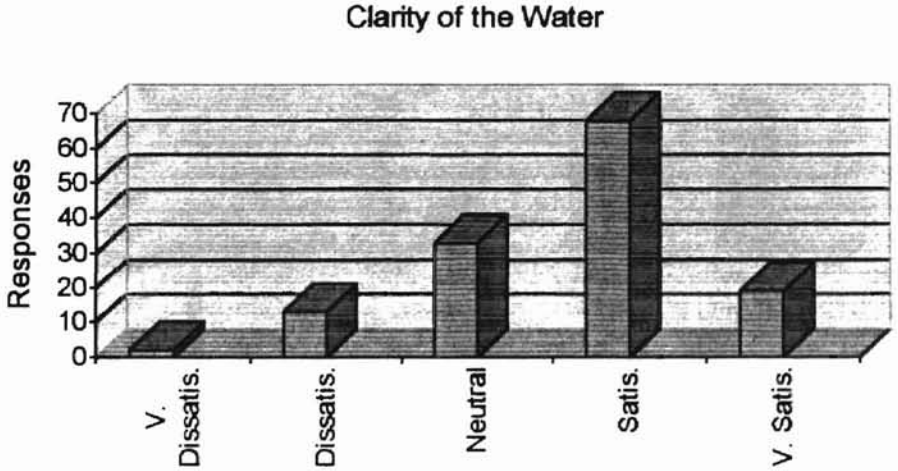
Wikle, Tom. Professor - Oklahoma State University.

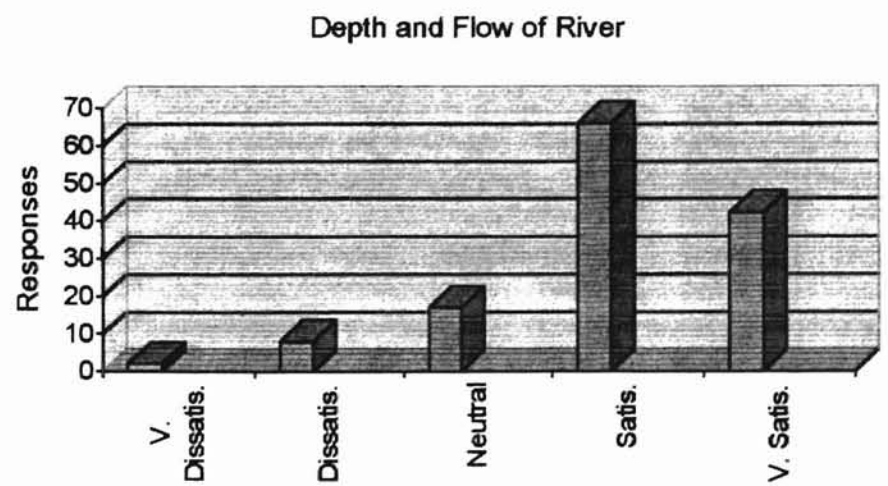
APPENDIX G

SATISFACTION QUESTION SUMMARIES

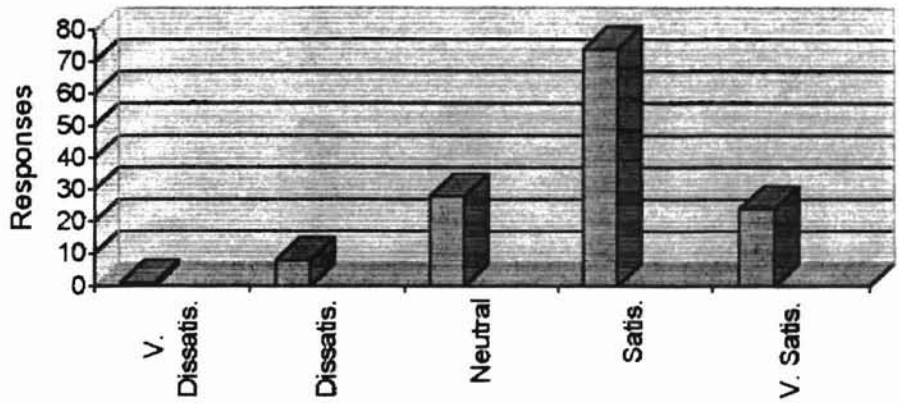
Post-Float Satisfaction Responses per Question.



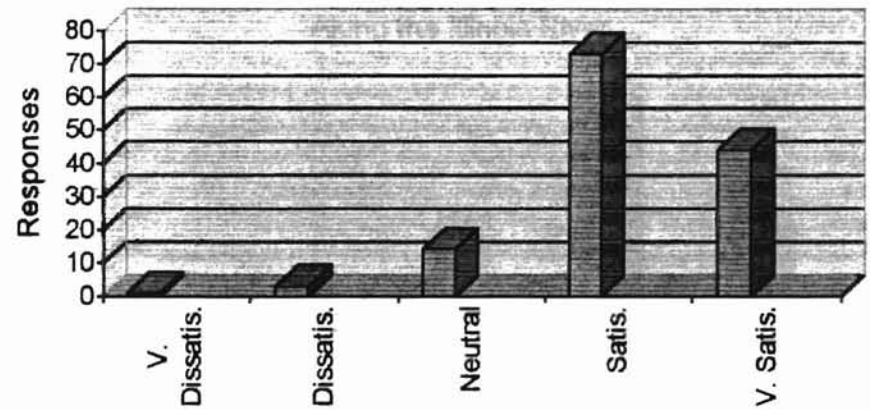




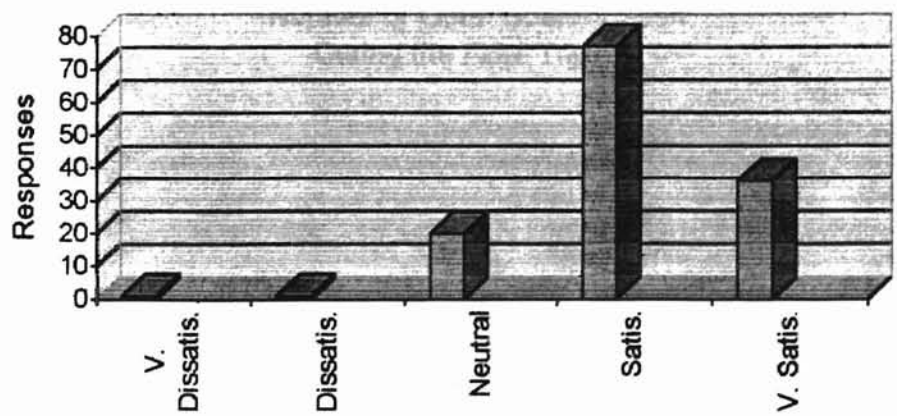
Appearance of River Banks



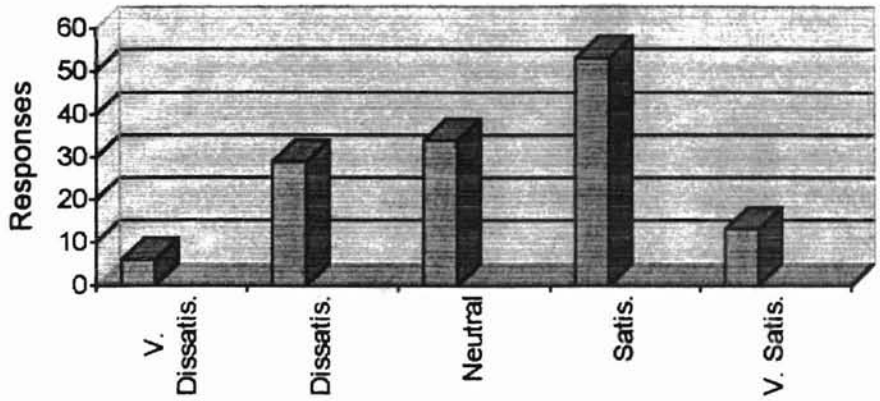
Scenic Quality of Valley



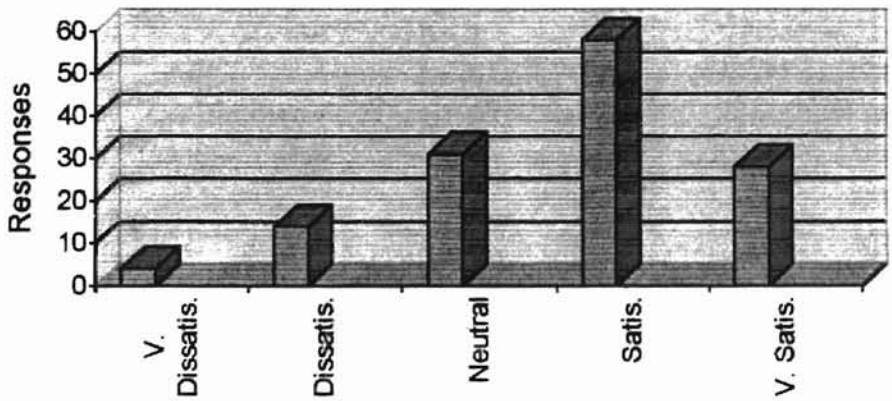
Naturalness of the Illinois River



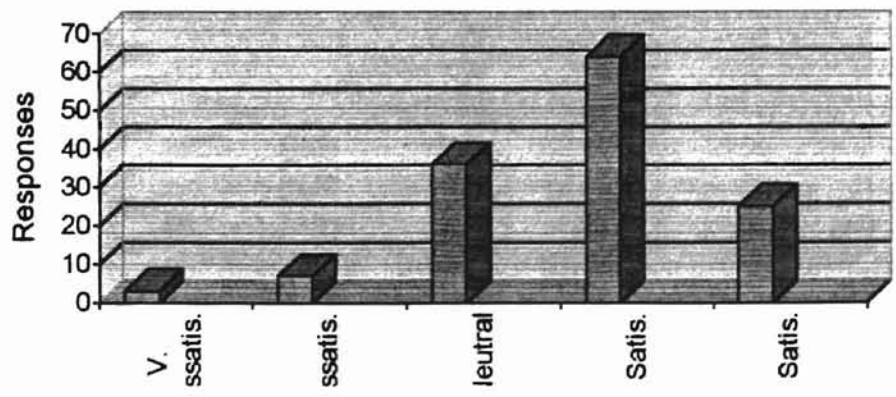
Cost of the Float Experience



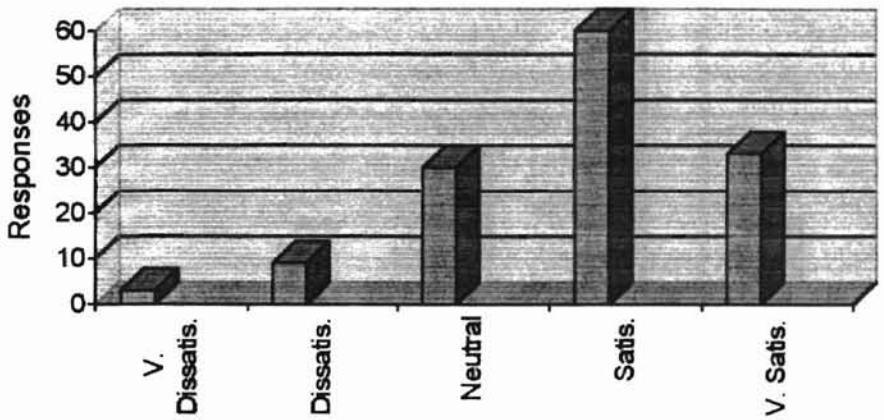
Amount of Trash Seen in and Along the Illinois River



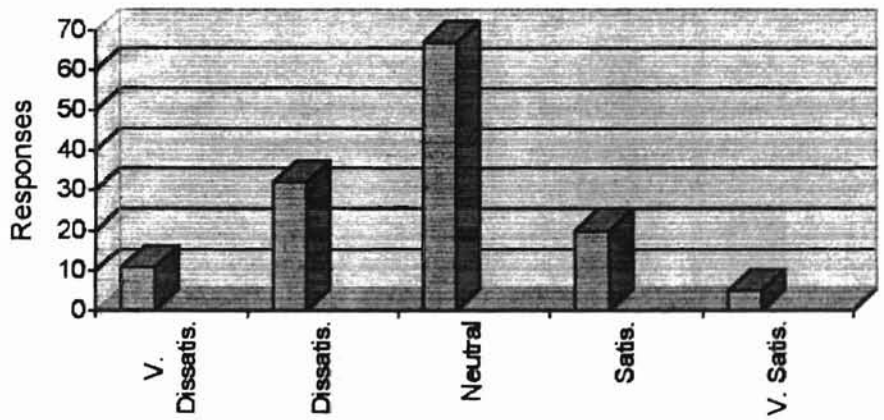
Number of Other Boaters Seen During the Float Trip



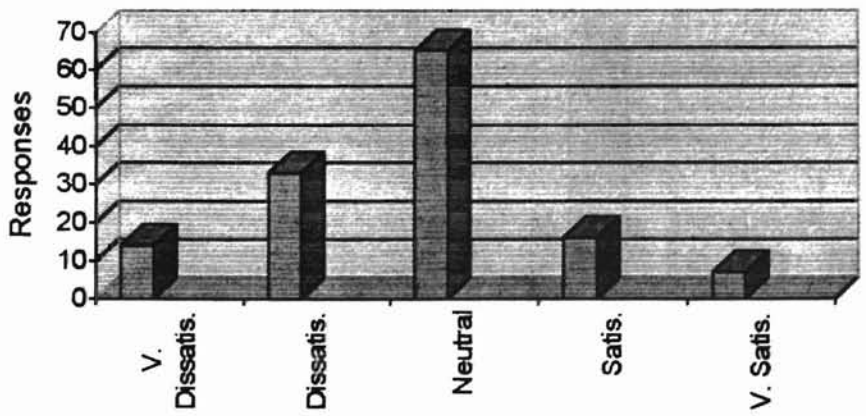
Behavior of Other Boaters Seen
During Float Trip



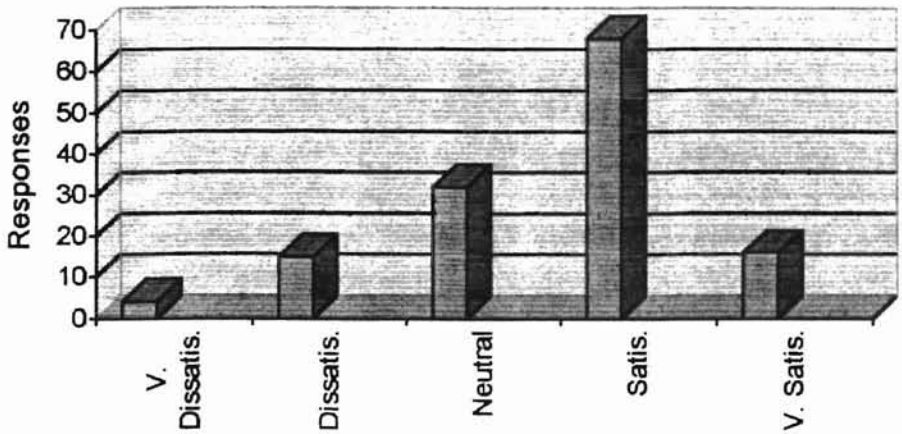
Location of Rest Rooms Along
Illinois River



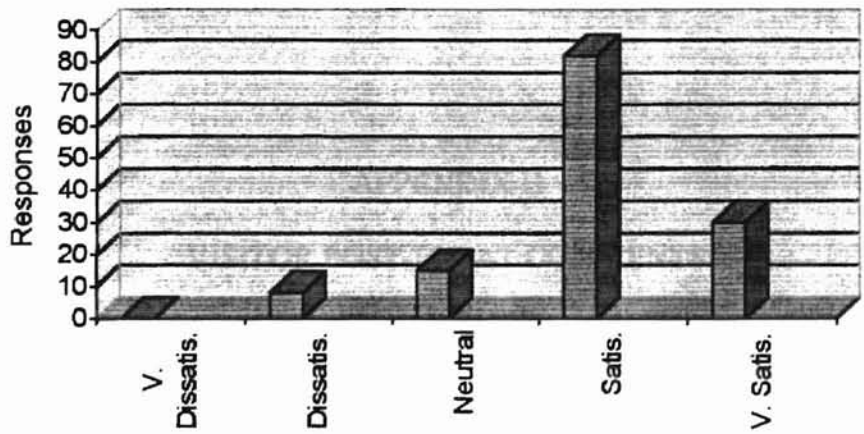
Number of Rest Rooms Along
Illinois River



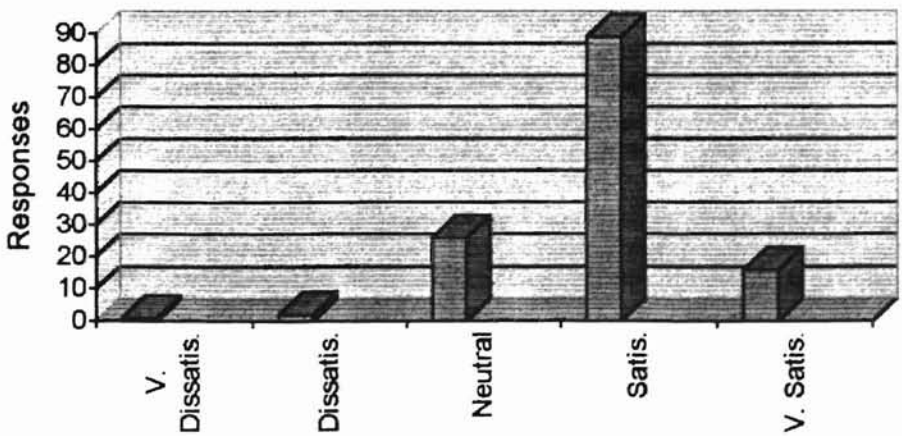
Information Provided by Outfitter



Condition of the Equipment for our Float Experience



Condition of the Property Adjoining the River



APPENDIX H

VISITOR POST-FLOAT COMMENTS

Visitor Comments in Response to Post-Float Question 16, "What changes would make a visit to the Illinois River more enjoyable for you?"

There seems to be a loss of wildlife from the river. If we could somehow preserve ecosystems while enjoying the river it would be good. Maybe provide more educational tools, exhibits, pamphlets about wildlife preservation and our effects on the river.

Shower areas should be better kept up. Cleaner. Water in showers were *(sic)* not real warm. Portable bathrooms closer to camp areas need to be cleaned more often. A little more affordable for people with smaller children. Bigger campsites.

Maybe include a compartment in the conoes *(sic)* to hold items floaters may bring with them. If the conoe tips over, there is a risk of losing your items.

I really think limiting the amount of beer would help people's behavior. I don't think it should be so easy to go ½ way down the River (on a 12 mile ride) and stop to get more beer. At the same time it should be the person's *(sic)* buying the beer decision to or not to and it is their poor judgement to drink that much *(sic)*. (People cussing out loud around kids is pretty bad!) *(sic)*.

I would like to bring my family canoeing or rafting, but the cost for a family of five is an expensive afternoon. For about the same price you can go to a theme park for a whole day. Maybe they could offer family rates for a family of 4 or 5 which would include 2 adults and 2 or 3 children.

Have patrols out on the river to remove the ones that have been drinking too much. Every time I have floated the river there has been some type "encounter" from an overly intoxicated person. We've been told that the river is patrolled but I have never seen an officer on the river.

Take out some of the partially submerged obstickles *(sic)*, and to stop further erosion near homes on the outside curves. Some how *(sic)* "police" the drunks. Other outfitter's *(sic)* on other river's *(sic)* give a trash sack to take along. We never saw one.

Educational lectures from outfitters on litter, restrooms, safety, Educational Programs *(sic)*.

There were some canoes overturned in the river and some trash but other than that it was great!

Well, I was Dissatisfied *(sic)* with the camp ground rules. you *(sic)* pay to get a cabin you should be able to stay up and party as long as you want. They showld *(sic)* have to *(sic)* different camp sites. One for family and one for people to de Their *(sic)* parting *(sic)*. Because that's what we get away from the city for, To *(sic)* get wild, Party *(sic)*, and relaxe *(sic)*.

Bigger showers and hotter water in shower.

Stock with more and bigger fish.

If theire *(sic)* wasent *(sic)* any drinking.

It was fun! In some places, it was a little too shallow.

More restrooms and knowing where they are. Canoes that do not leak, our's *(sic)* had a leak in the center of the canoe.

Cleaner water, and less parting of the others rafting.

Honestly, I enjoyed my trip a lot. It has been a while since, and I do not remember much detail. I will say, though, that I went into the trip a bit leary *(sic)* (I'm not the "camping type"); however, I had a GREAT time and was impressed that we had a fun place to go in Oklahoma.

Cleaning up the river banks.

Get paddles that aren't cracked, kinder outfitter higher water level (increase flow) *(sic)*.

Signs on how much futher *(sic)* you have to float. It was very difficult to know how much time it would take.

Make the float trip shorter. It took us 71/2 hours to go seven miles! I know the river may have been low that day, but for days like that, I suggest another drop off point where you only float maybe 3 or 4 miles. The 7 mile was fun, but it got to be <u>REALLY</u> long.

Fun places to stop at while you are floating, like slides and stuff.

The river was low so it took 5 hours to raft to the ½ way point. It would have been nice if the company that rented us the raft had told us about the mile markers, location of ½ way pt *(sic)* and restrooms, and expected length of trip.

Mileage markers indicating distances along the river. We experienced very low water during our trip and it was very slow. W thought we had missed the halfway point. Other boaters were equally confused. Some sort of reference signs would have been helpful.

If it didn't cost so much to float and I didn't see any restrooms down the river. Also it would nice *(sic)* if there were ropes from the tree's *(sic)* to swing into the river with.

Less tires in the water.

Too much alcohol on the river ride.

Less alcohol of other boaters would be nice. A few places to use a restroom would be good. Clean up trash.

It should not coast *(sic)* so much money to rent a canoe.

Cleaner restrooms and more organization at arrival point.

Limiting or spacing number of users on river to keep flow less crowded over trip.

Not charging 4 people to a raft when only 2 people are using it. A price break for children. Eagles Bluff restrooms at RV site were full of toilet paper and not useable! Not having a time limit on RV site destination- some of us work and then have to drive a long way to the River!

Cleaner restrooms at campsites. Hot water.

Seat cushions in the canoe. Trash bins. Rest rooms.

Deeper water. Your original survey had too many questions of technical nature. Biology student?

Let less people on River at one time. I think fish are suffering!

Our trip would have been more enjoyable if there were less boaters on the water. One time, the carelesness *(sic)*of other boaters caused us to capsize our own canoe.

Lower prices.

Going during the week. Never again on a Saturday, to *(sic)* crowded.

All of the life vests were moldy, cleaned up ones would be nice. I don't remember seeing. any rangers, would have like to have seen some. Some of the other boaters needed containment. Besides a <u>little</u> disappointment I had a <u>great</u> time.

I witnessed several underage drinkers. Maybe teens should be carded and check coolers. I realize that this may enfringe *(sic)* on their rights but to *(sic)* many accidents can occure *(sic)* with-out proper supervision. But overall our stay was enjoyable and I will return again.

Ban on all alcoholic beverages, stiff fines for littering, ban on cigarette smoking.

I think I visited at a bad time. Since the river was up so high, the beauty of the river was decreased.

Closer economical overnight facilities (motels, hotels, restaurants, etc).

The cost is very expensive. The campground should be mowed more often.

Better equipment.

Restrooms along the river.

Less expensive, friendlier people, cleaner and more restrooms.

The cost was way too expensive. We did not harm anything we used or the surroundings. Why should it cost us so much just to float down a river for a couple of hours? There weren't any restrooms nearby at all. Throughout the trip I only saw one rest stop with a bathroom.

People floating on air matresses *(sic)* that won't get out of your way when you've paid to float. People with bad language.

Restrooms alongside the river. Make sure campgrounds are mowed.

A cleaner (no beer cans) bank.

Not so expensive.

Water clarity- 15-20 years ago water clarity was better.

I would like the cost to be less.

I think it would be better if there were more places to jump into the river from a high point. Maybe some rope swings would be nice.

Large number of trees recently washed into River could be removed to make floats safer and scenery prettier.

Wasn't even aware that there were restroom facilities availible *(sic)*. I have canoed this river numerous times since the 1970's. I've never been on the river when it was as high as on our trip June 26 (1999).

Less rules!

More trashcans along the banks! We had so much trash and no place to put it- many people also have this problem, but they choose to litter.

Better weather. I think that might have added to the murkiness of the river. Had been down the Illinois River 20+ yrs. Ago and remembered it as being much more shallow and a slower current. I'm sure the rain also entered into that variable. Overall, pretty good

time. Kind of on the high $$ side for the length of trip that is *(sic)* was. Would consider going back, but would shop around for a better price per length of trip.

Restrooms along the way! More concessions.

I do understand that the price to float includes care for the river, etc, but I would be able to go much more often if the prices were a little lower. Other than that, I had a wonderful time as always!

Didn't see any restrooms (?#!).

It would be nice if the outfitters would provide a better life jacket for children. A rest stop with adequate restrooms that are clean and maintained.

Sometimes the 6-mile is too short and the 12-mile is too long. It would be nice to have a medium length trip. Also, not very senic *(sic)* although I enjoy the trip with group of friends *(sic)*.

More user friendly camping areas. Better postings as to river height and flow in rainy weather.

Drop the cost of camping and rafting.

Cleaner bathrooms at the outfitters. Bigger camping sites (more room per site).

better *(sic)* boats/rafts: ours had two leaks: one leaking out air and one leaking in water! Trash: Every year in the past I end up picking up beer cans and trash in great #'s. This year was different because there weren't that many people. But if you had asked me this question last year trash would be <u>the</u> biggest change.

Cleaner water. Less trash.

No drinking. No cussing. No smoking. Nicer busses.

if *(sic)* the cost was a little cheaper. Quite costly for family of 5 when its $18 per person.

it's *(sic)* a beautiful place, i *(sic)* was very satisfied with it and Thoughoughly *(sic)* enjoyed my trip.

Less water polution *(sic)*. Improving the smell from the chicken farms.

I would ad *(sic)* more restrooms along the trip. I would also ad a little more shelter for those like me that got burnt to a crisp. The cost of the rafts per person was way too expensive; $18.00 each person. Maybe ad some natural looking places to sit and eat, like a log bench and rock table. Some of the kids needed to be controlled. One was floating down the river without any floatation and was caught in a log. We also rammed right

into him. Trying to miss him, we got stuck and had ½ a raft full of water, almost losing all our gear. The kid didn't even thank us for getting him out.

More beaches either along the Banks *(sic)* or in the river. We wanted to pull up and eat our lunch and could'nt *(sic)* find a place.

Better restrooms at outfitters! Removal of some of the larger debris in river.

More rapids, whitewater.

More signs, more restrooms showing were *(sic)* you are.

Could pave the road to sparrow hawk. Could offer ride back to office where vehicles are parked.

Less cost and more people.

Some clean up along the banks. Better tent-camping electrical spots. Cleaner restrooms at outfitter camp.

Maybe some more restrooms.

Maybe make the beach areas around the river better for floaters- benches to sit on, more trash cans, etc.

Sometimes it is hard to determine which trip to take (6mile, 12 mile, 18 mile), because the time each one takes depends on how fast the river is each day. A six mile trip could take 4 hours one day and 2 hours the next. The float places should post (each day) the estimated time each trip should take for that day.

It would be very nice to have a few restrooms along river between all camps. There's a lot of people who don't want to pea *(sic)* in River or take a chance of getting poisin *(sic)* . Ivy or oak or snake bit. The weekend we went was on father's day weekend (1999) on Saturday. They didn't tell us river was up like it was *(sic)*. It was flowing very fast and it had a few dangerous spots. We took the 15 mile from Talaquh *(sic)* floats. There was a tree that had fallen across river. We crashed into it lost canoe *(sic)*. There was 2 people in canoe, one went with canoe under first tree and thur *(sic)* 2nd tree. The other person, was me, I stayed stranded on tree *(sic)*. While I was on tree I saw 3 young childern *(sic)* crash into tree, bearly *(sic)* made it and several others cash *(sic)* also. If there was a way to put up warning signs of dangus *(sic)* spots or cut or pull tree's *(sic)* free so they can go on down river. There could have been a very badley *(sic)* hurt people *(sic)*.

Lower the cost for floating down the River and clean the River banks from bottle cans and trash *(sic)*.

VITA

John Scott Jett

Candidate for the Degree of

Master of Science

Thesis: AN EVALUATION OF KNOWLEDGE, ATTRIBUTES AND SATISFACTION OF RECREATIONAL FLOATERS ON THE ILLINOIS RIVER

Major Field: Environmental Science

Biographical:

Personal Data: Born in Kansas City, Kansas, on October 4, 1966.

Education: Graduated from Bishop Ward High School, Kansas City, Kansas in 1985; received Bachelor of Science degree in from the University of Kansas, Lawrence, Kansas, with a major in Environmental Studies in May, 1989; Completed requirements for the Master of Science degree with a major in Environmental Science at Oklahoma State University in July, 2000.

Professional Experience: Worked as an Environmental Specialist at a private environmental testing laboratory for three years; worked with cetaceans as an Animal Behaviorist at an oceanarium for six years; worked as a Graduate Research Assistant during graduate study at Oklahoma State University.